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ABSTRACT

Due to the dynamic nature of science, and particularly scientific issues concerning the environment, it is a challenge to find materials for up-to-date lessons on these subjects. This publication helps teachers meet the challenge of emphasizing scientific principles and the natural functioning of the environment. Provided are a varied and interesting compilation of free or inexpensive supplemental materials and other resources. This guide is also suitable for teachers who want to present units in areas relating mathematics, social studies, or language arts skills to their science programs. The contents include: (1) "Book Publishers"; (2) "Resources"; (3) "Environmental Science"; (4) "Special Awards"; (5) "Special Resources"; (6) "Energy Education"; (7) "Marine Science Education, Secondary"; (8) "Marine Science Education, Elementary"; and (9) "Index." Availability and prices are included for most listings. (RT)

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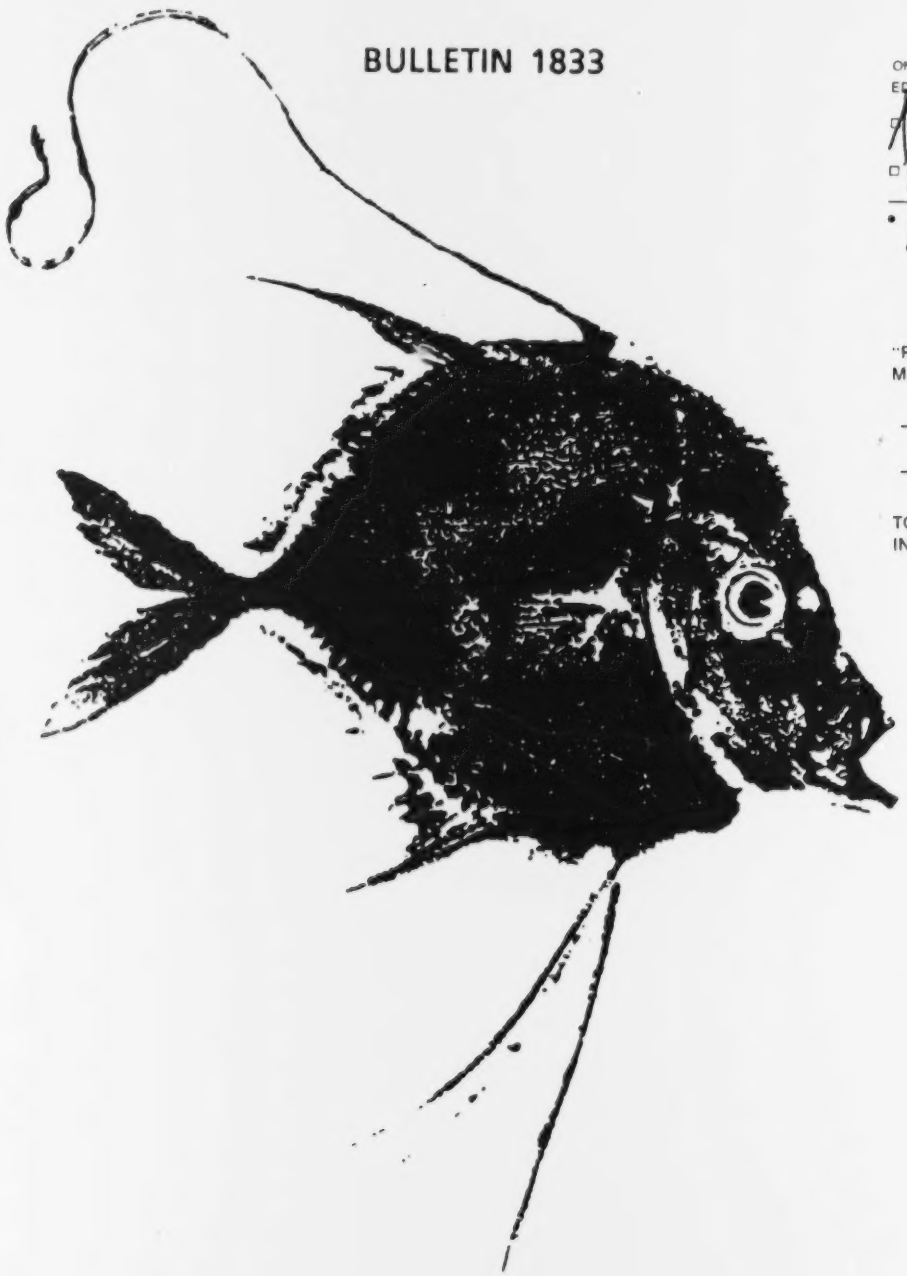
A RESOURCE GUIDE FOR ENVIRONMENTAL AND MARINE SCIENCE TEACHERS

BULLETIN 1833



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A RESOURCE GUIDE FOR ENVIRONMENTAL AND MARINE SCIENCE TEACHERS

Bulletin 1833

1988

James E. Barr, Supervisor

Science and Environmental Education

Louisiana Department of Education

Jean Pantell Sikora

Marine Science Education

Louisiana Sea Grant College Program

INTRODUCTION

Because of the dynamic nature of science, and particularly scientific issues concerning the environment, it is a challenge to find materials for up-to-date lesson plans on these subjects. We want to help teachers meet this challenge of both emphasizing scientific principles and the natural functioning of the environment. We therefore have assembled a varied and interesting collection of free or inexpensive supplemental materials and other resources into this *Resource Guide for Environmental and Marine Science Teachers*. We hope it will also be suitable for elementary, middle, and high school teachers who want to present units in these areas relating math, social studies, or language arts skills to their science programs.

This guide has been produced by the Louisiana Department of Education in cooperation with the Louisiana Sea Grant College Program.

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A RESOURCE GUIDE FOR ENVIRONMENTAL AND MARINE SCIENCE TEACHERS

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BOOK PUBLISHERS
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Some of the publishing companies which have a good selection of either environmental science books, or books on marine biology or oceanography suitable for use in the classroom, have been included in this listing. You can write asking for specific information about lab manuals, and source materials for teachers, in addition to further information about the textbooks available.

Addison-Wesley Publishing Co.
2727 Sand Hill Rd.
Menlo Park, CA 94025

Publications:
Introduction to the World's Oceans
Duxbury and Duxbury

Benjamin/Cummings Publishing Co., Inc.
2727 Sand Hill Rd.
Menlo Park, CA 94025

Publications:
Environmental Science
Chiras

Marine Biology
Lerman

William C. Brown Co.
2460 Kerper Blvd.
Dubuque, IA 52001

Publications:
Environmental Science

Introduction to the Biology of Marine Life

Oceanography

W.H. Freeman and Co.
41 Madison Ave.
New York, NY 10010

Publications:
Introduction to Environmental Science
Moran, Morgan and Wiersma

Harper and Row, Publishers, Inc.
10 East 53rd St.
New York, NY 10022-5299

Publications:
Marine Biology
Nybakken

Kendall/Hunt Publishing Co.
2460 Kerper Blvd.
Dubuque, IA 52001

Publications:
Global Science
Christensen

Prentice-Hall Allyn & Bacon
Secondary Division
Sylvan Ave.
Englewood Cliffs, NJ 07632

Publications:
Introduction to Oceanography
Ross

Saunders College Publishing
383 Madison Ave..
New York, NY 10017

Publications:
Environmental Science
Turk and Turk

Wadsworth Inc.
10 Davis Dr.
Belmont, CA 94002

Publications:
Living in the Environment
Miller

RESOURCES
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There are a number of very useful resources for the teacher produced by organizations which are not publishing companies. Many of these are listed in later sections of this guide in the sections titled "Energy Education", "Environmental Science", or "Marine Science Education". Listed here are a few which were not included in any of those categories.

Mr. James Culpepper
Office of Forestry
P.O.Box 1628
Baton Rouge, LA 70821

Publications:
Project Learning Tree Activity Guide
PROJECT LEARNING TREE is an award-winning environmental education program designed for teachers and other educators working with students in kindergarten through grade 12. It provides ready-made lessons and activities that can be used to supplement existing curricula. These activities are action-oriented and can be used in any order, require little in the way of specialized equipment, and can be easily adapted for use with children with special needs.

Mr. Hugh Burts
Louisiana Dept. of Wildlife and Fisheries
2156 Wooddale Blvd.
Suite 900
Baton Rouge, LA 70806

Publications:
Project Wild
PROJECT WILD is an interdisciplinary, supplementary environmental and conservation program emphasizing wildlife. Insructional activities within

the project WILD materials are designed for easy integration into school subject and skill areas---especially science, social studies, language arts and mathematics---so that classroom teachers may use the materials as a means by which to teach required concepts and skills while teaching about people, wildlife, and the environment.

Mr. Randy Lanctot
Louisiana Wildlife Federation
337 S. Acadian Thrwy.
Baton Rouge, LA 70806

Dr. James Barr, Supervisor
Science and Environmental Education
Department of Education
P.O. Box 94064
Baton Rouge, LA 70804-9064

Publications:
The Class Project
THE CLASS PROJECT was developed to help teachers make environmental education an integral part of the junior high or middle school curriculum. The Class Project's investigative, "hands-on" approach to learning in the classroom and the school grounds will give your students many skills they need to become involved in community conservation projects.

Coastal Zone Management Coordinator
Lafourche Parish Council
P.O. Drawer 5548
Thibodaux, LA 70302

Dr. James Barr, Supervisor
Science and Environmental Education
Department of Education
P.O. Box 94064
Baton Rouge, LA 70804-9064

Publications:
Lafourche Parish Coastal Zone Curriculum Resource Unit
This Resource Unit is a project aimed at specialized land-use problems. Students are encouraged to evaluate facts and ideas pertinent to the problem. It is not intended that these units will replace any existing curriculum, but that they will augment existing material to make the curriculum more relevant to today's issues.

The contents include sections on the coastal morphology, biology, and history of coastal Louisiana. A simulation game patterned after the Maryland Sea Grant *Decision Making: The Chesapeake Bay* Is one of the activities included.

National Parks and Conservation Association 1701 Eighteenth Street, N.W. Washington, D.C. 20009

This organization provides several excellent resources for teachers.

National Parks: More Than Just Places
A 22-minute slide/tape show about the history of the national park system and current resource threats facing the parks. Available for postage and handling costs.

Clean Air and the Parks A two hour videotape presentation on air issues which includes acid rain, visbility, and vegetation damage. Requires a 3/4" video cassette recorder, loaned for the cost of postage and handling.

OBIS
Lawrence Hall of Science
University of California
Berkeley, CA 94720

Outdoor Biology Instructional Strategies (OBIS) is an excellent program with a variety of outdoor activities (97) for youngsters to learn about and enjoy the environment in which they live.

The theme of OBIS revolves around ecosystems. Natural selection, successional changes, periodic changes in life forms, food chains, species dominance and density, behavior of organisms, interactions of organisms with their environment, and population structure are biological topics that are woven into their activities. These activities employ a variety of strategies such as games, simulations, craft activities, role playing, experiments, and data analysis.

Some activities can be used wherever you happen to find yourself: schoolyards, backyards, street parkways, vacant lots, streams, ponds, lakes, marshes, mudflats, rocky or sandy beaches. In addition to using accesible sites, OBIS uses inexpensive or homemade equipment, which enables more leaders to use the materials, and more students to be exposed to outdoor biology.

Last, but not least, leaders of these activities need not have an extensive background in biology. Any biological information necessary to lead an activity is presented in the folio.

Write to the address listed above for descriptive materials and for order forms.

National Association of Conservation Districts
NACD Service Department
PO Box 855

League City, TX 77573

Publications:
NACD Publications,
a catalog of available publications
Single copies free

Conserving Soil---a Practical Teaching Guide
Packed full of activities, background information , and teaching tools, this book includes a 16-page teachers' guide, four full-color overhead transparencies, and 24 spirit master (dittoes) ready for classroom use. Originally designed for science and social studies teachers grade 6-8, this book has been used by vocational agriculture and earth science classes, and outdoor education teachers.
Unit Price; $8.50

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ENVIRONMENTAL SCIENCE
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Acid Rain Foundation
1630 Blackhawk Hills
St. Paul, MN 55122

Contact: Dr. Harriet Stubbs
Executive Director

Acid Rain in Minnesota: Teacher's Resource Guide
Seventeen interdisciplinary classroom activities, in Economics, Literature, Government, Environmental Studies, Speech, and Drama.

Acid Rain Reader (Grades 4-6)
A primer for students, providing a general overview on acid rain.

Acid Rain: Science Projects (Grades 5-12)
Innovative interdisciplinary projects, utilizing scientific method, reviewed by a national panel of scientists, educators, teachers, and students. Includes activities in pH, logorithms, plants, microorganisms, reading and futures.

The Air Around Us: An Air Pollution Primer
A booklet for students, the general public, or the school library. A review of air quality issues with technical information well illustrated. Can be used with general audiences.

Coloring Book
"Rain, Rain Go Away." Pictures and a short story.

Curriculum: Acid Rain (Grades 4-8)
Twelve interdisciplinary activities include lesson plans and student pages. Subjects of science, math, social studies, art and language arts. Includes information, poster, and pH paper.

Curriculum (Grades 6-12)
-LIFE SCIENCES, BIOLOGY
-EARTH SCIENCES
-PHYSICAL SCIENCES, CHEMISTRY
-SOCIAL SCIENCES
These are interdisciplinary activity units consisting of pre/post test, classroom activities, and bibligraphy.

Information Packet
-ELEMENTARY
-SECONDARY
These are general overview packets which include brochures, articles, legislation, and a poster which explain acid rain, causes, effects and possible remedies.

Acid Rain Quiz for Kids (Grades 4-8)
Thirty worksheets for use in the general classroom as part of

curriculum units on Acid Rain.

Acid Rain Word Find (*Grades 4-8*)

pH Low Ion Test Kit (*Grades 4-8*)
Test kit of pH paper, 2 glass vials and color chart.

Poster Packet
Includes Acid Rain Foundation Poster and U.S. Fish and Wildlife Service Poster.

Transparencies
The story of acid deposition on 12 multi-colored transparencies.

Tree Cores
Teaching aid to show tree growth. An actual tree core, donated to the Acid Rain Foundation, Inc. by a well known scientist. These red spruce cores are set into cherry wood (1 1/2 x 12 x 1/4 inches), finely sanded, ready for your finish or polyurethane.

Tree Core Activity with a Single Tree Core
Activity instructions and illustrated description on how and where the tree core was collected. Package contains a student worksheet, and the tree core sample.

American Forestry Association
1319 18th Street, N.W.
Washington, DC 20036
(202) 667-3300

Contact: David Le

Gypsy Moth Workbook
Twenty-five projects to teach children about the gypsy moth are coded into three age group levels. Quizzes, puzzles, word games, and a skit are included.

American Society for Environmental Education
P.O. Box 800
Hanover, NH 03755-0800
(603) 448-6697

Contact: Karen Crowley
Executive Director

American Environment
Published quarterly (formerly *The Environmental Education Report and Newsletter*). Focuses on one topic of contemporary environmental concern in each edition and presents feature articles, up-to-date

information, and resource/reference materials relating to that edition's topic. A special "Teachers' Pages" section lists various resources for teachers on a variety of environmental topics. Past editions have focused on acid deposition, resource recovery, indoor pollution, hazardous wastes, air pollution, and water quality. Future editions will cover environmental values education, pesticides, and household toxics.

Environmental Education Study Projects for High School Students
A 14-page booklet covering environmental problem-solving through independent study.

A Basic Source List of Environmental Educational Materials
A 20-page list of books, periodicals, and bibliographies on environmental education.

Bullfrog Films
Oley, PA 19547
(215) 779-8226

Contact: Maria Ballas

Catalog listing many excellent, award-winning films on ecology and the environment for young people is available upon request.

California Waste Management Board
Resource Conservation Division
1020 9th Street, Suite 300
Sacramento, CA 95814

Contact: Marylou Shurtleff
Associate Government Program Analyst

Solid Waste Environmental Education Program (SWEEP)
"The Wizard of Waste" (Grades 2-4)
"The Trash Monster" (Grades 5-7)

This 10-lesson plan includes teacher's guide, filmstrip and cassette tape, pretest and post-test, picture cards, home information leaflets, and pupil booklets. Self-contained, interdisciplinary units designed to teach students resource conservation skills they can apply on a daily basis.

Citizens for a Better Environment
942 Market Street, Suite 505
San Francisco, CA 94102
(415) 788-0690

Contact: Julia E. May

Living With Insects In the Big City (*Grades K-3*)
Urban insect ecology and safe pest management curriculum. Ten 40-50 minute units. Includes visual aids.

Community Environmental Council
930 Miramonte Drive
Santa Barbara, CA 93109

Contact: John McGinness

Various environmental materials for young people.

Disney Educational Productions
500 South Buena Vista Street
Burbank, CA 91521

1-800-423-2555 (TOLL FREE)

Educational Media (*Grades K-12*)
Catalog listing environmental filmstrips, films, videotapes, and computer software for young people is available upon request.

DOW Chemical U.S.A.
Health and Environmental Sciences
Midland, MI 48640

Life Is In The Balance
Dow Chemical publishes a booklet on risk assessment. This booklet weighs the questions of risk and benefit to today's world. Covers the concept of risk assessment within the context of environmental science. Designed for grades 9-12. Available free to teachers.

Environmental Action Coalition
625 Broadway
New York, NY 10012

Econews (*Grades 4-6*)
Children's newsletter. Back issues available on various topics.

Curriculum Guides
Include background information for teachers, student activity plans, and annotated resource lists.

-GREEN SPACES IN CITY PLACES (forestry in an urban environment)

-CITY TREES, COUNTRY TREES (forestry)

-PLANT A TREE FOR ARBOR DAY (forestry)

-DON'T WASTE WASTE! (waste disposal)

-WOODS AND WATER (water supply and conservation)

Global Tomorrow Coalition/West
708 S.W. Third Avenue, Suite 227
Portland,OR 97204
(503) 295-0382

Contact: Amy E.Holm
Education Director
Western Office

Education Packets (Grades K-12)
Contains background information, lesson plans, hand-outs, posters, and a glossary.

-TROPICAL FORESTS
-POPULATION
-BIOLOGICAL DIVERSITY
-CONSIDER THE CONNECTIONS

Institute for Environmental Education
32000 Chagrin Boulevard
Cleveland, OH 44124
(216) 464-1775

Contact: Mary M. Roberts
Vice President

A Curriculum Activities Guide to Water Pollution and Environmental Studies, Volumes I and II
Volume I is divided into 4 chapters: the hydrologic cycle, human activities, ecolgical perspectives, and social and political factors, with each chapter involving the students and the teacher in action-oriented activities in the community, laboratory, or both. Volume II contains laboratory and field testing procedures; considerations for implementing water studies; bibliography, including periodicals,films; glossary; safety tips. Suggested for senior high use.

A Curriculum Activities Guide to Water Pollution Equipment and Environmental Studies
Written by high school students with art contributions from professional

draftsmen, this guide tells how to build 22 basic, relatively nontechnical devices for measuring water quality parameters and related factors, such as rainfall, slope, topography. Each construction plan includes a list of materials needed, sources, costs, and tools required. Chapter 2 describes combinations of equipment constituting basic, intermediate, or advanced test kits. Instructions may be adapted for elementary students by substitution of materials or preparing assembly beforehand. Suggested for upper elemetary, junior and senior high school levels.

A Curriculum Activities Guide to Solid Waste and Environmental Studies
The activities in the guide offer students a general understanding of the problems of solid waste management and provide a framework for further study and exploration of more technical works on the subject. These 26 intermediate level activities are designed for community involvement in both rural and urban settings. The activities require from one class period to several weeks to complete. Process skills called upon include categorizing, measuring, inferring, questioning, and evaluating. The appendices include a glossary, bibliography. Suggested for elementary, junior high, and senior high schools.

A Curriculum Activities Guide to Watershed Investigations and Environmental Studies
The "whys" and "hows" of studying a watershed are explored here, including the theories, goals, and objectives, for watershed in schools. Chapter II suggests strategies for a successful public relations program to complement the studies. Later chapters address introductory activities for the field and classroom.

Project Ice
c/o Robert Warpinski, Director
1927 Main Street
Green Bay, WI 54301

Project ICE
Project ICE offers a total K-12 curriculum and instruction program for environmental education. Its primary goal is to lead students directly or subtly to awareness, appreciation, recognition and action regarding vital issues, concerns, and factors shaping environmental attitudes and values.

Iowa State Department of Education
Grimes State Office Building
Des Moines, IA 50319
(515) 281-3146

Contact: Duane Toomsen
Environmental Education Consultant

Enviromental Education Enrichment
Various materials for young people are available. Outlook is a completely interdisciplinary program for use in all grades, K-12. It has been developed based on 11 environmental topic/issue spheres, six themes, and a developmental scheme which focuses on the cognitive abilities of the students.

Izaak Walton League of America
1701 North Fort Myer Drive, Suite 1100
Arlington, VA 22209
(202) 528-1818

Contact: Karen Firehock

Save our Streams
Stream adoption program. Guide entitled "Save Our Stream Activities for Kids" helps young people find stream problems and ways to solve them.

Learning to Love Streams: Save Our Streams (grades 4-12)
A collection of teacher lesson plans for stream activities and monitoring. Designed to test stream water quality and to pinpoint problems.

Save our Streams Kit
Everything needed to start an effective and active stream monitoring program. Includes a New Citizens Guide to Clean Water, SOS stream survey, vocabulary list, stream insect identification and chart, promotion hints, erosion fact sheet, project ideas, registration card, poster, and bumper sticker.

A Stream Watchers Stream Guide
Tips on identifying pollution in streams and practices to reduce it.

Keep America Beautiful, Inc.
99 Park Avenue
New York, NY 10016

Closing The Circle
High school studies unit developed by Keep America Beautiful, Inc. is a resource-type unit that assists the teacher in developing projects to improve the visual quality of the environment. The materials are free to educators.

Pick Up The Pieces
High school studies unit developed by Keep America Beautiful, Inc. is an activity-type unit that assists the teacher in developing projects to improve the visual quality of the environment. The materials are free to educators.

Many other publications ,and a wide assortment of posters, pamphlets, and slide programs are available free to teachers.

Michigan Media
University of Michigan
Media Resources Center
400 Fourth Street
Ann Arbor, MI 48103-4816
(313) 764-5361

Catalog listing environmental films for young people is available upon request.

Modern Talking Pictures
5000 Park Street North
St. Petersburg, FL 33709
(813) 541-7571

Catalog listing environmental films for young people is available upon request.

National Arbor Day Foundation
100 Arbor Avenue
Nebraska City, NE 68410
(402) 474-5655

Grow Your Own Trees(*Grades K-3*)
Filmstrip, audio cassette,Activity sheets, teacher Handbook.

National Audubon Society
613 Riversville Road
Greenwich, CT 06830
(203) 364-0520

Contact: Sayre Beekley
Assistant to the Vice President for Education

Audubon Adventures (*Grades 3-6*)
The National Audubon Society's youth education program for elementary school classes and other groups of children. An enrolled class or group receives Audubon Adventures bimonthly newspaper for children, the companion Leader's Guide of background information and activity ideas for the teacher, as well as student membership cards and decals.

The Egret Express

Newsletter of the National Audubon Society's Education Division.

Living Lightly in the City, Volume I (Grades K-3)
The primary level book is filled with action-oriented activities which stimulate primary grade children to explore their surroundings and develop a positive image of themselves and their environment. Many of the activities focus on language development, particularly the use of action-oriented words, as children actively participate in discovering more about the world around them. The book's six units contain a variety of resource materials, including mobile patterns, flannel board cut-outs, mystery cards, student activity sheets and posters. Puppets, poetry, challenging art projects and games are all utilized.

Living Lightly in the City, Volume II (Grades 4-6)
The intermediate level curriculum has 11 units which cover a broad range of topics including land use, water resources, transportation, nature in the city and Native American philosophy. The topics are presented in action-oriented activities, relevant to the lives of 4th-6th grade students. The volume has 60 transparency designs, mystery cards, and student activity sheets.

Living Lightly on the Planet, Volume I (Grades 7-9)
Junior high school students will discover some of our limits to growth as they explore global population concerns and delve into land use issues. Environmental concerns at home are also emphasized in investigations covering groundwater, life-styles and urban ecology. Students will role play a variety of viewpoints, study consumer habits from the point of view of an extraterrestrial being, and create displays to communicate conservation and recycling activities.

Living Lightly on the Planet, Volume II (Grades 10-12)
The senior high guide is designed to help students apply knowledge of ecological concepts to human interaction with the land. Global concerns such as famine, rain forest conservation, and maintaining peace are presented in investigations which challenge students' critical thinking, communication and problem-solving skills. Activities are designed to help students discover the nature of the acid rain problem and the root of our hazardous waste dilemma. They will also be encouraged to debate the nuclear power issue and explore the possibilities for alternative energy, appropriate technology and lifestyles for the 21st century.

National Geographic Films
17th & M Streets, N.W.
Washington, DC 20036
(202)921-1330

Catalog listing environmental films for young people is available upon request.

National Wildlife Federation
1412 16th Street, N.W.
Washington, D.C. 20036-2266
(202) 797-6800

Nature Scope (*Grades K-7*)
Classroom-activity series, each issue focusing on a specific area of nature and science teaching. Inclludes up-to-date background information about that issue's topic; activity ideas to reinforce learning; ready-to-copy activity sheets; a craft section and an appendix. Past issues have addressed the following topics:
-WADING INTO WETLANDS
-AMAZING MAMMALS (PARTS I AND II)
-DIGGING INTO DINOSAURS
-WILD ABOUT WEATHER
-DISCOVERING DESERTS
-INCREDIBLE INSECTS
-BIRDS, BIRDS, BIRDS!
-TREES ARE TERRIFIC
-ASTRONOMY ADVENTURES
-GEOLOGY: THE ACTIVE EARTH

Let's Clear the Air
Filmstrip and slide/tape describe substances that pollute air, what harm they do, and what is being done to help control them. They also address problem of acid rain---what it is, what it does, and why some parts of the country are hurt worse than others. Discuss both indoor and outdoor air pollution. Fifteen minutes, narrative script, educator's guide.

Discover Wildlife In Your World
Filmstrip and slide/tape present animals of many environments and discuss special techniques for attracting wildlife and improving habitat, in an urban, suburban, or rural setting. Ten minutes, narrative script, educator's guide.

Soil - We Can't Grow Without It
Filmstrip and slide/tape discuss soil and its significance to plants, animals, and people, Fifteen minutes, narrative script, educator's guide.

Water - We Can't Live Without It
Filmstrip and slide/tape show how freshwater habitats support wildlife, what threatens our water supply, and how we can conserve this vital resource for future generations. Fourteen minutes, narrative script, educator's guide.

We Care About Eagles
Filmstrip and slide/tape offer a close look at eagles and the environmental problems that have threatened some species. Fifteen minutes, narrative script, educator's guide.

Ranger Rick (*Grades K-6*)

Monthly natural science magazine for young people. True adventures, stories, photographs, puzzles, games, contests, and pull-out surprises.

National Park Service
U.S. Department of Interior
Southeastern Regional Office
3401 Whipple Avenue
Atlanta, GA 30344

Many publications are available free to teachers and the general public. Maps, historical, natural history materials are available.

The Nature Conservancy
Suite 800
1800 North Kent Street
Arlington, VA 22209

Student Stewardship Program
The Nature Conservancy's new environmental action program for high school and college students is aimed at promoting the development of additional natural areas. Students who participate in this program can assist in identifying those areas that are potentially unique and should be saved or preserved. The price of the teacher's manual is $25.00. Student workbooks are $19.00.

Pyramid Films
Box 1048
Santa Monica, CA 90406
(213) 828-7577

Catalog listing environmental films for young people is available upon request.

Sierra Club
c/o Pat Suiter
P.O. Box 557953
Miami, FL 33255-7953
(305) 666-2906 (evenings only)

Sierraecology
Environmental education bimonthly newsletter.

The Old Bullfrog (Grades K-1)
A lesson in nature study about a wise old bullfrog who outwits a hungry heron. Includes 1 filmstrip and 1cassette, teacher lesson plan,

and student activity sheets.

The Lorax (*Grades 2-5*)
An introduction to ecology and conservation. A once beautiful forest becomes a smog-covered dump. The loud and dire warnings of the Lorax are ignored for short-term monetary gains. Includes 2 filmstrips and 2 cassettes, teacher lesson plan, and student activity sheets.

Pollution: Don't Just Stand There - Do Something (*Grades 3-7*)
This program provides an introduction to many current pollution issues. Through specific examples, children learn what pollution is, how it is caused and why we should be concerned about it. They will also learn what people can do to help solve the problem. Includes 4 filmstrips and 2 cassettes.

The Interdependence of Nature (*Grades 4-6*)
This four-part program emphasizes the importance of conservation by demonstrating the interrelationships in nature. Includes 4 filmstrips and 2 cassettes.

Will They Survive? (*Grades 3-7*)
This two-part program examines the reasons certain species are endangered, what has been done to save them, and their chances for survival.

Wildlife Needs You
Brochure on the importance of protecting wildlife. Written specifically for children.

Judy's Solid Waste Lesson Plans (*Grades 5-6*)
Classroom activity plans for teaching children about the problems of solid waste.

Environmental Coloring Books
A list of good environmental coloring books available who outwits a hungry heron. Includes 1 filmstrip and 1 cassette, from various sources.

Other Materials
These are available on a variety of environmental subjects. Describe the topics you wish to know more about and Pat Suiter will send the materials she has and information on obtaining additional materials.

Soil and Water Conservation Society 7515 N.E. Ankeny Road Ankeny, IA 50021-9764 (515) 289-2331

Contact: Tim Kautza

Microcomputer courseware for Apple and IBM computers
Includes a two-sided diskette, 30-page student manual, and a 30-page teacher's guide that includes more than 50 activities and 60 teaching

strategies that blend soil and water conservation into language arts, mathematics, social studies, and science curricula. All are carried in a three-ring binder.

The Story of Land - Its Use and Misuse through the Centuries Grade 4 and above)
A 16-page full-color cartoon booklet and 4-page teacher's guide. Presents the history of land use from 4500 B.C. to the present focusing on conservation in the United States from the 1600's. Describes what young people and others can do to help conserve natural resources.

Plants: Improving Our Environment (grade 4 and above)
A 16-page full-color cartoon booklet and file folder teacher's guide with 4 activity masters. Describes how humans are dependent upon green plants for food, water, shelter, and oxygen and how we use plants for pollution abatement, soil conservation, beautification, building materials, and much more.

Robots of Cave Alpha: Creating a Livable Land (Grade 4 and above)
A 16-page full-color cartoon booklet; file folder teacher's guide with 4 activity masters. Adventure story that focuses on the role of the individual in environmental decision-making.

SPECIAL AWARDS
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Science Service
1719 N Street, N.W.
Washington, D.C. 20036.

Program: SCIENCE TALENT SEARCH
Westinghouse Electric Corporation sponsors a scholarship and cash awards for the annual Westinghouse Science Talent Search. This seach is open to high school students.

Duracell Educational Program
P.O. Box 14312
Dayton, Ohio 45414

Program: FOURTH ANNUAL DURACELL SCHOLARSHIP COMPETITION
Duracell Inc. sponsors this scholarship competition. The competition is based on developing a device powered by a Duracell battery. Teachers may obtain a Duracell educational program designed to help in the teaching of electrochemistry and related subjects through battery technology. The program is available free to teachers.

1986 Science Essay Awards Program

c/o Biology Bulletin Monthly
3500 Western Avenue
Highland Park, IL 60035.

Program: ANNUAL SCIENCE ESSAY COMPETITION
The annual science essay competition sponsored by the Biology Bulletin Monthly in cooperation with the National Science Teachers Association and Science Digest magazine.

Dr. Robert A. Dean
P.O. Box 80953
San Diego, CA 92138

Program: THOMAS EDISON MAX MCGRAW ANNUAL SCHOLARSHIP PROGRAM
This project is sponsored by the National Science Teachers Association, National Science Supervisors Association, and the Council of State Science Supervisors. Any high school student in grades 9-12 can apply.

NACD/DEUTZ-ALLIS
Conservation Education Awards for Teacher-of-the-Year
Suite 730
1025 Vermont Avenue, N.W.
Washington, D.C. 20005
(202) 347-5995

Program: CONSERVATION AWARD FOR TEACHERS
This program is co-sponsored by the National Association of Conservation Districts and the Deutz-Allis Corporation. The objectives of the awards program are to create an awareness and appreciation of the value of conservation education and to stimulate efforts by teachers to advance the wise use, protection, and enhancement of the nation's resources.

SPECIAL RESOURCES
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Center for Energy Studies
E. Fraternity Circle
Louisiana State University
Baton Rouge, LA 70803-0301
(504) 388-4400

Publication: LOUISIANA ENERGY INDICATORS
This newsletter covers both current information about the status of energy in Louisiana and current research in energy. It provides a good source for research projects and recent data on energy.

Department of Natural Resources
Coastal Zone Management
P.O. Box 44124
Baton Rouge, LA 70804
(504) 342-7591

Publication: Many publications are available.
There are a number of pamphlets, posters, and booklets that are available free to teachers.

Geological Survey
P.O. Box G
Louisiana State University
Baton Rouge, LA 70893

The Louisiana Geological Survey publish maps and documents that can be purchased. These may be used in earth science or environmental science courses. Special films and video tapes are available for specialized use.

LSU Museum of Geoscience
Louisiana State University
Baton Rouge, LA 70803

Coloring Book(*Grades 4-10*)
Small coloring book available that shows a geological time scale and various dinosaurs. Copies are available free to teachers.

Louisiana Cooperative Extension Service
102 LSUAC Administration Building
Louisiana State University
Baton Rouge, LA 70893

Cooperative Extension, through 4-H, publishes many guides and booklets on areas related to science and mathematics. These may be obained from local cooperative extension offices or the main office at LSU-Baton Rouge.

National Science Teachers Association
1742 Connecticut Ave.
Washington, D.C. 20009.

Publication: MEMBERSHIP CATALOG
NSTA publishes a catalog for educators that contains all of the publications that science and mathematics teachers may find helpful.

The catalog is free of charge to teachers.

Louisiana Science Teachers Association
University High
Louisiana State University
Baton Rouge, LA 70803
(504) 388-3221

Publication: LASER
Laser is a newsletter produced to inform science and mathematics teachers about activities at the local, state, or national level. Included in the newsletter are suggestion for laboratory activities, instructional methods, and helpful publications available for teachers. Subscriptions are included with a membership fee of $7.00.

Jackie Temple
Louisiana Department of Agriculture
P.O. Box 44365
Baton Rouge, LA 70804
(504) 292-4856.

Project: AG IN THE CLASSROOM
Publications: AG IN THE CLASSROOM
The U.S. Department of Agriculture has produced a program entitled "Ag in the Classroom." This project is designed to help create greater awareness for students K-12 about agriculture and food science.

Louisiana Forestry Commission
P.O. Box 15239
Broadview Station
Baton Rouge, LA

Program: ARBOR DAY IN LOUISIANA
Arbor Day is celebrated annually by every state in the union as tree planting day. The purpose is to foster the ideals of conservation so that our trees in the city as well as in the forests will be productive and properly managed to continue to provide many benefits for present and future generations. The story of Arbor day, along with program suggestions, songs, poems, and posters about choosing and planting a tree, are included with a booklet entitled "Arbor Week in Louisiana" which is available from any Louisiana Office of Forestry headquarters. Also, each headquarters will have a supply of one-year-old bare-root hardwood and pine seedlings available. Write the local forestry districts for these free booklets or contact the main office.

U. S. Department of Interior
Bureau of Land Management
Washington D. C. 20240

Publication: ALL AROUND YOU
This is an activity-oriented guide book for classroom teachers that begins in the classroom and moves outside to the schoolyard, the town, and natural areas or rural areas. An excellent guide for environmental education. Designed for grades 5-12. Available free to teachers. Extra copies are $2.50.

Division of Archaeology
Department of Culture, Recreation, and Tourism
P.O. Box 44291
Baton Rouge, LA 70804
(800) 535-8388

Publication: CLASSROOM ARCHAEOLOGY
Publication designed to aid teachers in teaching archaeology to middle school or high school students. It may be used in teaching Louisiana Studies or socio-environmental factors that have affected Louisiana.

Department of Culture, Recreation, and Tourism
P.O. Box 44291
Baton Rouge, LA 70804
(800) 535-8388

River Trails, Bayous and Backroads
Publication designed to assist citizens to find unique areas of the state. Applications for the booklet in biology, earth science, and Louisiana studies are many. Designed for the general public. Available free to teachers.

The Office of Tourism has developed many booklets and pamphlets about each of the State's parks and commemorative areas. All are designed for the general public. Available free to teachers.

LSU Museum of Natural History
Louisiana State University
Baton Rouge, LA 70803

Museum Guide
Small booklet designed to be used with a tour of the museum. Excellent source of general information on natural history. Designed for grades 3-7. Copies are available free to teachers.

National Association of Conservation Districts
P.O Box 855
League City, TX 77573-9989

Conserving Soil
This is a must for teachers in general science, earth science, biology, or environmental science. CONSERVING SOIL consists of 4 full-color over head transparencies, 24 spirit masters, and a 16 -page teachers guide. Designed for students 5-12. Single copies are $8.50

LAFAYETTE NATURAL HISTORY MUSEUM AND PLANETARIUM
637 Girard Park Drive
Lafayette, LA 70503

Resource: ENVIRONMENTAL EDUCATION/NATURAL HISTORY
The Lafayette Natural History Museum produces and supports many publications and programs. This museum is one of the most valuable sources of information for educators on south Louisiana natural history.

Walter B. Jacobs Memorial Nature Park
West Lakeshore Drive
Blanchard, LA 70503

Resource: ENVIRONMENTAL EDUCATION/NATURAL HISTORY
The Walter B. Jacobs Nature Park, is one of the largest nature centers in Louisiana. The park is located in Caddo Parish on over 160 acres. The park offers an excellent setting for students to study the natural environment of North Louisiana.

Louisiana Nature Center
11000 Lake Forest Blvd.
New Orleans, LA 70127

Resource: ENVIRONMENTAL EDUCATION/NATURAL HISTORY
The Louisiana Nature Center is dedicated to demonstrating man's interdependence with nature. A quiet preserve in the midst of the city of New Orleans. An educational institution with special programs for students and ideal for family and group field trips.

LUMCON
Louisiana Universities Marine Consortium
Star Route Box 541
Chauvin, LA 70344
(504) 851-2800

Contact: John Trowbridge

LUMCON offers a variety of educational services. In addition to the regular, planned field trips and activities (described in a brochure available on request), activities utilizing the LUMCON laboratories and research vessels can be planned to suit special needs, concerns, or topics in marine education, coastal zone and barrier island ecology.

Young Entomologist's Society
Department of Entomology
Michigan State University
East Lansing, MI 4882-1115

Program: ENTOMOLOGY PROGRAM FOR YOUNG STUDENTS
This is an organization designed to foster an interest in entomology. Membership is $3.00/year.

Marketing and Consumer Services Department
Gulf States Utilities Company
P.O. Box 2951
Beaumont, TX 77704

Publication: YOUR GUIDE TO SCIENCE FAIR PROJECTS:
FROM IDEA TO EXHIBIT
Excellent publication for teachers and students who are planning a science fair, or science fair project. Designed for grades 3-12. Single copies are available free to teachers.

Louisiana State Science Fair
C/O Dr. John Nye
Department of Agricultural Engineering
149 Doran Ag. Eng
Louisiana State University
Baton Rouge, LA 70703

Publication: LOUISIANA STATE SCIENCE AND ENGINEERING FAIR
Brochure on the Louisiana State Science Fair and information on all regional fairs. Brochure is available free to teachers.

Instructional Television Section
Bureau of Academic Support
State Department of Education
P.O. Box 94064
Baton Rouge, LA 70804

Teacher's Handbook for Instructional Television
A necessary publication for all teachers who use ITV programs with their instructional programs. Single copies are available free to teachers.

Bureau of Curriculum, Inservice, and Staff Development
State Department of Education
P.O. Box 94064
Baton Rouge, LA 70804

Publication: LIFE SCIENCE CURRICULUM GUIDE
EARTH SCIENCE CURRICULUM GUIDE
PHYSICAL SCIENCE CURRICULUM GUIDE
K-6 ELEMENTARY SCIENCE CURRICULUM GUIDE
BIOLOGY CURRICULUM GUIDE
CHEMISTRY CURRICULUM GUIDE
PHYSICS CURRICULUM GUIDE
ENVIRONMENTAL SCIENCE CURRICULUM GUIDE
All of these publications should be available through the central office of every school system.

Louisiana Academy of Science
c/o Dr. Ronald E. Smith
Department of Physics
Northeast Louisiana University
Monroe, LA 71209
(318) 342-3120

Publications: Journal of the Louisiana Academy of Science
LAS sponsors a annual meeting each year and publishes a journal of technical papers. Cost of membership is $15.00

National Hunting and Fishing Day
P.O. Box 1075
Riverside, CT 06878

Publications: NHF DAY SCHOOL KIT
Prepared at the request of students and teachers, the National Hunting and Fishing Day School Kit contains numerous booklets and posters on conservation and wildlife management. The kit is available free to any teacher interested in sponsoring activities in conjunction with NHF Day. Designed fo grades 5-12.

U.S. Geological Survey
National Cartographic Information Center

Bldg. 3101
National Space Technology Laboratories
NSTL Station, MI 39529

Publications: THE SKY'S THE LIMIT
Publication on the services that the NCIC offers to the general public. Information on map reading. Free of charge

Science Service, Inc.
1719 N Street, N.W.
Washington, D.C. 20036

Publications:
RULES OF THE INTERNATIONAL SCIENCE AND ENGINEERING FAIR
Prepared for the use of organizing and judging the international science fair. Free of charge.

The following addresses are other sources for educational materials:

National Council of State Garden Clubs, Inc.
4401 Magnolia Avenue
St. Louis, MO 63110

Public Information Center (PM-211-B)
Environmental Protection Agency
820 Quincy St. N.W.
Washington, D.C. 20011

American Conservation Association
30 Rockefeller Plaza, Room 5600
New York, NY 10020

Defenders of Wildlife
2000 N. Street, NW
Washington, D.C. 20036

ELSA Wild Animal Appeal (Louisiana Chapter)
c/o Laura Lanza
1540 Chateau Circle
Lake Charles, LA 70605

Louisiana Bass Chapter Federation

c/o Mike Thomas
783 Randy Lane
Haughton, LA 71037
(318) 949-8450

Wildlife Management Institute
1101 Fourteenth Street NW, Suite 725
Washington, D.C. 20005

Wilderness Society
1901 Pennsylvania NW
Washington, D.C. 20006

American Association of Zoological Parks and Aquariums
1110 Vermont Avenue, NW, Suite 1160
Washington, DC 20005

ENERGY EDUCATION
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Alabama Solar Energy Center
c/o University of Alabama
in Huntsville
Huntsville, AL 35899
(205) 895-6257

Publication:
Building and Using the Solar Greenhouse (9-A)
Booklet gives passive solar principles, greenhouse design, planning steps and materials, and greenhouse recommendations. Includes sections on pests and diseases, and greenhouse savings. Other publications available.

American Institute of Architects (AIA)
1735 New York Ave, NW
Washington, DC 20006
(202) 626-7300

Publications:
Energy Efficiency Needn't Cloud Your Life (9-A)
Eight panel brochure presents energy efficiency as part of current architectural design instead of an unestablished, uncomfortable, and expensive way to modify a home. Useful introduction to design considerations.

Twenty Questions (9-A)
Brochure on the basics of energy efficiency and solar power in buildings presented in a question and answer format. Useful overview of energy consumption and conservation in buildings. Other Publications available.

American Solar Energy Society
2030 17th St.
Boulder, CO 80302
(303) 443-3130

Publication:
Solar Overviews (9-A)
Booklets discuss the basic principles of active and passive solar heating and cooling systems, their economics, advantages, and disadvantages.

Archer Daniel Midland Co.
Box 1470
Decatur, IL 62525

(217) 424-5200

Publication:
Look Where Our Corn Goes (9-A)
Brochure, 24 pages, describes corn processing and its products: fuel alcohol, gluten feed, corn oil, and carbon dioxide.

Arizona Solar Energy Commission
Room 501, West Wing, Capitol Tower
1700 W. Washington
Phoenix,AZ 85007
(602) 255-3303

Publication:
Bright Ideas (6-12)
Tabloid Newsletter published six times each school year covers one solar concern, technique, or concept in each issue. Supporting classroom experiments and activities and a materials review section also appear in each edition. Recent issues have discussed economics, shading and landscaping, adobe, cooking, and photovoltaics.

Arizona State University
Bill Tillery
Department of Physics
Tempe, AZ 85287

Publication:
Arizona Energy Education (7-A)
Journal covers many energy topics including solar and conservation technologies and issues. Provides background reading, examples, and statistics.

Arkansas Energy Office
One State Capitol Mall
Little Rock, AR ysics
Tempe,AZ 85287

Publications:
Achieving Self-Reliance: Backyard Energy Lessons (7-12)
This Volume encompasses a series of articles on appropriate technology projects in Arkansas.

New and Improved Energy for Arkansas (6-9)
The Arkansas Energy Office collected their fact sheets and pamphlets into a book that has been used successfully by junior high classes as background material. Earth-sheltered houses, moveable insulation, insulation and cooling, passive solar retrofits, and natural cooling are

among the topics covered.

Arkansas Energy Future: Solar Energy (9-A)
A 72-page booklet covers the basic concepts and applications of solar energy for space conditioning and photovoltaic electricity. Discusses solar ponds, taxes, economics, financing, and solar's relationship to to conservation. Includes interesting profiles of PV-powered college in Mississippi County, AR and Solar-cooled multi-family housing project in Conway, AR.

Solar Fact Sheets (9-A)
This informative series offers general orientation, discusses conversion system types, performance and costs,and/or gives how-to guidance and consumer tips.

Technical Brief: Batch Water Heaters (9-A)
Fact sheet discusses the characteristics of these low cost solar hot water systems. Describes system components and how to assemble them.

Technical Brief: Designing the Passive Sunspace (9-A)
Brief Report defines the principles and functioning of a solar greenhouse and offers guidance for their sizing and design.

Technical Brief: Direct Gain Systems (9-A)
Fact sheet describes the basic function of the window and thermal mass of this passive solar system, compares storage media and provides simplified design and sizing guidelines.

Arkansas Energy Future: Solar Greenhouses (9-A)
This 40-page pamphlet covers the basic greenhouse principles and components design, glazing, insulation, storage, ventilation---and notes good construction and gardening practices.

Bonneville Power Administration
Public Information Office, AI
PO Box 3621
Portland, OR 97232

Publications:
Indoor Air Pollution (9-A)
Pamphlet describes reasons for and sources of indoor air pollution. Mentions BPA research on the question and outlines energy efficient control strategies.

Conservation and Renewable Energy
Inquiry and Referral Service (CAREIRS)
PO Box 8900
Silver Spring, MD 20907
(800) 523-4949

Publications:

CAREIRS Conservation Pack (7-A)
Background information includes the newest TIPS FOR ENERGY-SAVERS from the U.S. Department of Energy, annotated bibliography on insulation, and fact sheet on indoor air pollution.

Books on Renewable Energy for Elementary Grades (K-5)
Two-page annotated bibliography, current as of January 1984. Grade level of each entry noted.

Renewable Energy Reading List for Young Adults (6-12)
Short bibliography, current as of January 1984, lists books, pamphlets, construction plans, reports, and articles. Grade level of entries noted.

CAREIRS Kid Pack (1-12)
Includes resources annotated elsewhere: SOLAR ENERGY AND YOU, LEARNING ABOUT RENEWABLE ENERGY, and reading lists for lower and upper grades.

CAREIRS Renewable Energy Pack (7-A)
Information in this collection covers photovoltaic references, wind suitability and practicality, ethanol facts, and a general introduction to renewable resources.

Renewable Energy: An Overview (9-A)
Information sheet describing solar heating and cooling (active and passive systems), solar electricity, biomass resources, hydropower, and briefly, ocean energy. Sources of further information and bibliography included. Clear, nontechnical descriptions.

Solar Energy and You (4-8)
Fact sheet discusses basic active and passive solar heating, home heating solar energy storage in clear, nontechnical language. Concludes with reading comprehension questions, questions to guide further research, and a short discussion of heat transfer.

Solar Energy Audio-visual Materials (K-A)
Annotated 24-page film and videotape list notes grade level of most entries. Updated December 1983.

CAREIRS Consumer Pack (7-A)
Several fact sheets thoroughly discuss converting a home to solar heat, planning the design, installation, and upkeep of solar space or water heating systems, and climate fundamentals (incident solar radiation, degree days, micro-climate of a site). A Q&A discussion is included.

CAREIRS Domestic Hot Water Pack (7-A)
Collection of background materials includes an annotated bibliography and discussion of solar hot water basics: components, systems types, site assessment, collector location, and installation tips.

CAREIRS Passive pack (7-A)
Collection includes information on passive design principles, sunspaces

and solar greenhouses, low cost passive retrofits, and passive cooling strategies.

Solar Collector Types and Components (9-A)
Fact sheet describes flat plate, evacuated tube, and concentrating collectors.

City of Santa Clara
Solar Heating and Cooling Project
1500 Warburton Ave.
Santa Clara, CA 95050
(408) 984-3183

Publication:
City of Santa Clara Solar Projects (9-A)
Booklet on two of the largest solar heating/cooling systems in the country, installed in municipal facilities by the City of Santa Clara. Flyer and several articles describing the solar utility program also available.

Colorado Office of Energy Conservation
112 E. 14th Ave.
Denver, CO 80203
(303) 866-2507

Publications:
Fireplaces: Function, Use, and Maintenance (9-A)
Booklet gives practical advice and physical explanation of the most effective use of fireplaces and fireplace modifications.

Service in Action (9-A)
This fact sheet series covers selecting a wood stove, stove operation and safety, wood fuel (heating value, seasoning, etc.), and hints for safe harvest of fuelwood.

Connecticut Energy Division
Office of Policy and Management
80 Washington St.
Hartford, CT 06115
(203) 566-5803

Publications:
Save Ten to Forty Percent on gasoline (9-A)
Fact sheet gives detailed information on ways to increase MPG through driving techniques, trip planning, and vehicle selection and maintenance

Safe and Warm Wood Heat (9-A)

Substantial reports from a variety of sources, each with their own title provide detailed information on buying, installing, operating, and cleaning a wood heater. Many also cover locating, cutting and burning wood. All emphasize safety and many include a reference list.

Denver Energy Resource Center
CO Energy Extension Service
Conservation and Solar Energy
Mail Stop CE-26
1000 Independence Ave, SW
Washington, DC 20585
(202 252-23363

Publication:
Institutional Manager's Guide to Energy Conservation (11-A)
Booklet describes steps to devise an energy management program, rationale for policy, and sources of additional information.

Department of Energy (DOE)
Technical Information Center
U.S. Department of Energy
PO Box 62
Oak Ridge, TN 37830
(615) 576-1302

Publications:
Conservation I (Science Activities in Energy) (4-6)
Fourteen activities and teacher's guide emphasize personal energy use and present experiments involving ventilation, heat loss, simple thermostats, insulation, conserving hot water, and energy saving strategies.

Conservation II (Science Activities in Energy) (9-12)
Eleven experiments with teacher's guide explore insulation materials, R-value, illumination and lighting efficiency, recycling, saving hot water and the economics of electric batteries. Teachers should be cautioned that some of the electrical connections shown are unsafe.

Project Retro-Tech (9-A)
Four-volume instructional course for weatherization workers discusses conduction, infiltration, insulation and R-value, how to select appropriate weatherizing methods, and provides charts for calculating heat loss through a building.

Providing for Energy Efficiency in Homes and Small Buildings (9-A)
Five-volume instructional unit for vo-tech classes begins with basic energy conservation facts, presents detailed information on heat loss and gain, estimating heating/cooling load, efficiency of equipment and options, etc. Teacher's guide included. Dated description of energy

production and consumption, costs, and projections, but basic lesson content is useful.

Electrical Power Research Institute (EPRI)
Communications Service Department
PO Box 10412
Palo Alto, CA 94303
(415) 855-2147

Publications:

Conservation: Managing Our Energy Resources (9-12)
Fact sheet describes efforts being made by various consumers of electricity, as well as steps being taken by electric utilities, to save energy. Set of 35 Energy Reporters with one teachers guide free from EPRI.

Earth's Renewable Resources(9-A)
December 1981 issue of the EPRI JOURNAL can serve as background and reference material. Articles cover solar heating and cooling, geothermal and wind, solar thermal electric, photovoltaics, biomass, and fusion.

EPRI Slide Library Catalog (4-A)
Spiral-bound catalog presents a sampling of the Electric Power Research Institute's photo library. Renewable topics include geothermal, solar heating and cooling, hydroelectric, solar thermal, and wind.One copy of each slide free; free catalog.

Electricity from Water: Hydroelectric Power (9-12)
Fact sheet explains how hydroelectric dams and pumped storage facilities work. Discusses current interest in this technology. Set of 35 Reporters with one teacher's guide available free from EPRI.

Hydroelectric Power (9-A)
Short informational publication presents pros and cons of small and large hydroelectric plants. Examines pumped storage technology and surveys research underway to increase hydro's contribution to the energy mix.

Solar Heating and Cooling (9-A)
Fact sheet discusses various solar heating and cooling strategies and their impact on electric utilities.

Solar Heating and Cooling: Energy From the Sun (9-12)
Fact sheet describes active and passive solar heating and cooling systems and discusses the impact of their use on an electric utility. Set of 35 Reporters with one teacher's guide free from EPRI.

Electricity from the Sun: Technology for Solar Power (9-12)
Fact sheet discusses solar thermal power conversion, photovoltaics, and the role of solar electricity in the overall supply picture. Set of 35

Reporters with one teacher's guide free from EPRI.

Electricity from the Earth: Geothermal Energy (9-12)
Fact sheet describes three kinds of geothermal energy---hydrothermal, geopressured, and petrothermal. Also discusses methods of harnessing each. Set of 35 with one teacher's guide free from EPRI.

Geothermal Energy (9-12)
Nontechnical report discusses geothermal potential.

Electricity from the Wind: New Use of an Old Source (9-12)
Fact sheet discusses resources, siting, kinds of turbines, and economics of electric power production from wind. Set of 35 with one teacher's guide free.

Energy Resources Center of
the Pikes Peak Region
PO Box 267
Colorado Springs, CO 80901
(303) 636-2447

Publications:
Burning Wood Better (7-A)
Brochure discusses "getting the most from your wood and reducing air pollution." Colorado-specific information, but single copies available nationally.

Solar Energy: Let's Talk Dollars and Sense (9-A)
Brochure gives a summary of costs and benefits of seven kinds of solar/conservation retrofits. Possible savings and comparison with return from other kinds of investment are interesting.

Energy Source
Energy Education Program
5505 E. Carson St., Suite 250
Lakewood, CA 90713
(213) 420-6814

Publications:
Fossil Fuel Junction (3-4)
Unit opens with a showdown between energy conservers and energy wasters. After a thorough introduction to the fossil fuels, closes with a discussion of conservation strategies for students.

Offalot (K)
Multimedia instructional kit includes a puppet who turns things "off a lot." Emphasis on home energy users, energy conservation strategies, and safety practices.

Energy Choices and Challenges (9-12)
As Part of a three-week unit including teacher's guide, filmstrips, and pre- and post-tests, an excellent discussion of conservation resources and potential is presented. Hydro, solar and other renewables are covered as well.

Florida Solar Energy Center
300 State Road 401
Cape Canaveral, FL
32920-4099
(305) 783-0300

Publications:
Window Treatment for Energy Conservation (9-A)
Fact sheet gives nontechnical discussion of most efficient use of windows for heating, cooling, ventilating, and lighting a home.

Solar Energy in Florida (9-A)
Fact sheet gives an overview of solar heating and cooling, photovoltaics and biomass resources and their applications.

Passive cooling Ideas for the Southeast(9-A)
Fact sheet discusses siting considerations, landscaping, ventilative and convective cooling, heat gain prevention, night sky cooling. Reminds readers of historic use of passive cooling techniques.

Solar Domestic Hot Water (9-A)
Reports, fact sheets, and books from various sources describe types of systems, economics, sizing, performance, pay-back, maintenance requirements, and consumer tips.

Solar Heating of Swimming Pools: A Question and Answer Primer(9-A)
Fact sheet covers costs, types, siting, performance, and lifetimes of several types of collectors.

Photovoltaics: A Question and Answer Primer (9-A)
Fact sheet covers how PV's work, how cells are made, costs, applications present status, and future potential.

Georgia Office of Energy Resources
270 Washington St, SW
Atlanta, GA 30334
(404) 656-5176

Publications:
A Builder's Guide to Energy Efficient Homes (9-A)
Discussion of various conservation strategies from a professional point of view gives more technical detail and helpful comparison than most guides. Includes plans for energy efficient houses, sections on solar

and wood heating, and complete economic and marketing analyses.

Putting the Sun to Work (9-A)
Three-volume series on solar energy use in buildings, these books cover "direct" solar (active and passive space conditioning), wood burning, and renewable electricity. Systems are compared to each other and their usefulness is rated.

Solar Wall Heater Planbook
Solar Breadbox Water Heater Planbook (9-A)
Two do-it-yourself manuals provide detailed directions for building and installing each component of the system. Short product guides and materials lists are included.

Idaho Department of Resources
Bureau of Energy Resources
Statehouse
Boise, ID 83720
(208) 334-443

Publications:
A Consumer Information Pamphlets (9-A)
Fact sheets give general reviews of topics such as conservation, insulation, trombe walls, earth-sheltered housing etc. Some concern construction methods, others deal with generic systems and their capabilities.Of special interest to teachers is the pamphlet on how to make AN INEXPENSIVE SUNSIGHTER to determine a site's access to sunlight.

The Idaho Sunspace Handbook (9-A)
This volume is both a guide for the do-it-yourself crowd and a regional text on the principles of passive systems. Includes an extensive glossary.

Indiana Department of Commerce
Division of Energy Policy
Indiana Commerce Center
One North Capitol, Suite 700
Indianapolis, IN 46204-2248
(317) 232-8940

Publications:
Energy Dispatch: Lighting Fact Sheet (9-A)
Report reviews various kinds of lamps and suggests ways to conserve energy used for lighting.

Energy Dispatch: Modifying Your Gas Furnace to Save Energy (9-A)
Report includes an explanatory schematic that shows placement of several energy conserving retrofits. Discussed: automatic flue dampers,

flue restrictors, furnace "derating", electronic pilot, etc.

Energy Dispatch (9-A)
These six- and twelve-page reports discuss central heating with wood, fire-place efficiency, purchasing wood, and woodburning water heaters. Clear, nontechnical style make these especially appropriate for class room background reading.

Indiana Department of Education
Energy Education Curriculum Project
Division of Curriculum
Room 229, Statehouse
Indianapolis, IN 46204
(317) 232-6610

Publications:
An Energy Curriculum for the Elementary Grades (K-1)
UNIT I: ENERGY AND YOU---Unit introduces personal and home energy use and emphasizes the importance of conservation. One of a series of three units for elementary students.

Lessons from an Energy Curriculum for the Senior High (9-12)
UNIT II: ENERGY CONSUMPTION AND CONSERVATION IN THE HOME; UNIT IX: ENERGY CONSERVATION AND THE LAW---Two of nine high school units that use lessons adapted from other sources to discuss conservation. Each unit is composed of several lessons that include objectives, background information, activities and resources. Accompanied by teacher's guide.

Lessons from an Energy Curriculum for the Senior High (9-12)
UNIT IV: FOSSIL FUELS AND ENERGY ALTERNATIVES---One of nine high school units that use lessons adapted from other sources, this unit emphasizes coal and solar. Each lesson includes objectives, background information, activities and resources. A teacher's guide accompanies the unit.

Kansas Energy Extension Service
Engineering Extension Programs
Ward Hall
Kansas State University
Manhattan, KS 66506
(913) 532-6026

Publications:
Energy Ingenuity (4-A)
Semi-annual tabloid newsletter covers conservation and renewable topics. Includes a children's section and a list of current publications.

Energy Conservation in Agricultural Transportation(9-A)

Fact sheet is concerned primarily with cutting energy use in shipping farm products to consumers. Provides an overview of energy-efficient new equipment, modifications for existing equipment, conservative driving practices, regular maintenance, and optimal shipment routing.

Sizing Fixed Overhangs for Solar Collectors (9-A)
Pamphlet describes solar angles, shading needs, and the conjunction of the two. Supplies a graph with which to calculate the required size of an overhang.

Energy from the Sun: Practice and Applications (9-A)
Book provides an excellent introduction to terms, components, and functions of various active and passive solar systems. Readers are escorted through various calculations, and the text uses graphs and tables advantageously. Sections on economics and tax incentives are dated, but generally the text is very useful.

Kentucky Energy Cabinet
PO Box 11888
Iron Works Pike
Lexington, KY 40578-1916
(606) 252-5535

publications:
Earth-Sheltered Housing (9-A)
Booklets from several sources summarize the design needs of an underground structure, advantages, and building techniques.

Window Treatments for Energy Efficiency(9-A)
Automatic slide-tape presentation explains how windows gain and lose heat and suggests preventative strategies.

Micro-Hydroelectricity for the Southeastern United States (9-A)
Booklet discusses the advantages and constraints of developing and using micro-hydropower.

Sunspaces for the Southeastern United States (9-A)
Booklet covers the principles and construction of passive solar greenhouses.

Louisiana Department of Natural Resources
Energy, Research, and Planning Division
PO Box 44156
Baton Rouge, LA 70804

Publications:
Energy Activities for Home Economics Classes
A 105-page, easy to use teacher's guide of energy conservation activities. Activities are provided in the area of housing, home

management, consumer education, textiles and clothing, and food and nutrition.

Home Energy Conservation (9-A)
Consumer guides from a variety of sources discuss behavioral strategies and do-it-yourself retrofits to improve energy efficiency. How to find infiltration points, caulk and weatherstrip doors and windows, and install insulation are the most frequent topics covered.

Manual for Building Energy-Efficient Homes in Louisiana(9-A)
Aimed at home builders, and filled with Louisiana-specific topics, this guidebook is an interesting and unusual presentation of energy-efficient building strategies. Text and data cover insulation, siting, glass (passive solar heating and daylighting), ventilation, heating and cooling, appliances.

Evaluating Wind Energy Potential in Louisiana (9-A)
This report presents a methodology for assessing the onshore potential of the wind as a source of energy in Louisiana.

Massachusetts Executive Office
of Energy Resources
100 Cambridge St..Suite 1500
Boston, MA 02202
(617) 727-4732

Publications:
Energy Saver's Series (9-A)
Produced by the Massachusetts Audubon Society, these six well illustrated readable booklets tell a residential audience what conservation measures can be taken, how much they will cost, and how much they will save. These booklets, filled with information that will be useful to teachers and students, cover:
HOW TO WEATHERIZE YOUR HOME OR APARTMENT
ALL ABOUT INSULATION
HEATING SYSTEMS MAINTENANCE AND IMPROVEMENT
ENERGY-SAVING APPLIANCES
SOLAR IDEAS FOR YOUR HOME OR APARTMENT
FINANCING HOME ENERGY IMPROVEMENTS.

Michigan Energy Administration Clearinghouse
Michigan Department of Commerce
PO Box 30228
Lansing, MI 48909
(517) 373-0480

Publications:
Solar Spots (K-8)
Covers solar, conservation, and wind in more than 20 infusible

activities for young students. Emphasizes the need for conservation and the need to diversify our energy sources.

Missouri Division of Energy
PO Box 176
Jefferson City, MO 65102
(314) 751-4000

Publications:
Energy Facts Series (9-A)
Sixteen one- to four-page fact sheets offer brief discussions of renewable sources and conservation strategies. Some of the more unusual topics are methane production from biomass, wood gasification, solar cooking, natural cooling, and used oil recycling.

National Audubon Society
950 Third Ave.
New York, NY 10022
(212) 832-3200

Publications:
Audubon Energy Plan Summary (160A)
Short, semi-technical sketch of Audubon's two-volume plan to supply domestic energy needs by 2000 with accelerated introduction of renewable resources and conservation strategies.

National Center for Appropriate Technology (NCAT)
PO Box 2525
Butte, MT 59702-2525
(800) 428-2525

Publications:
Heat-Recovery Ventilation for Housing: Air-to-Air Heat Exchangers
(9-A)
Booklet teaches owner-builders, building trades-people, and designers how to size ventilation systems for energy-efficient housing. Major emphasis os placed on the air-to-air heat exchanger.

Introducing Supplemental Combustion Air to Gas-Fired Home Appliances
(9-A)
A booklet shows consumers and building trades-people how to increase heating system efficiency by using outside or supplemental combustion air and also includes a set of basic how-to instructions to allow consumers to build necessary ducts and vents. Building code and safety implications of these actions are thoroughly addressed.

Moisture and Home Energy Conservation (9-A)

Booklet focuses on detecting moisture problems in the home and correcting them. Includes a training supplement on how to conduct a moisture audit in a home.

Window Insulation: How To Sort Through the Options(9-A)
Booklet examines problem areas with the technology including choosing the right design for the window, how to choose a workable installation method, and how to size up your window insulation needs given climate, cost, and home orientation.

Appropriate Technology at Work(9-A)
Highlights twenty outstanding projects funded by the U.S. Department of Energy Appropriate Technology Small Grants Program (1978-1981). These case studies make interesting reading and good models for school programs.

Home-Made Electricity: An Introduction to Small Scale Wind, Hydro and Photovoltaics (9-A)
Introduces the use of wind, water, and the sun as electricity producers and, based on experiences of AT grantees, helps the reader make a realistic appraisal of these systems. Excellent photographs and graphics.

An Introduction to Biogas Production on the Farm(9-A)
Introduces farm-size biogas production and includes a brief discussion on how to evaluate the biogas production potential of a specific ranch or farm.

Wastes to Resources: Appropriate Technologies for Sewage Treatment and Conversion (9-A)
Book presents background information on conventional and alternative sewage treatment in the U.S. and the key issues facing municipal sewage managers. Uses case studies and excellent graphics to illustrate main points.

Solar Greenhouses and Sunspaces: Lessons Learned (9-A)
Booklet focuses on the experiences of hundreds of DOE grantees who designed and built greenhouses. Examines individual greenhouse components, including framing, glazing, storage, ventilation, and control mechanisms. Question and answer format makes easy reading, and case studies yield some definitive modifications to popular solar wisdom.

Using the Earth to Heat and Cool Homes(9-A)
Book focuses on installation, economics, reliability, and performance of systems using low-grade geothermal energy and earth-tempered air systems Includes sections on lessons learned, common questions, and sources of help.

National Wood Energy Assoc.
The Hill, Jeremiah Hart House

PO Box 4548
Portsmouth, NH03801
(603) 436-1921

Publications:
Wood Is Good (*9-A*)
Paper discusses use of waste wood for industrial and utility steam/power generation, and includes a discussion of economic, environmental, and energy independence benefits.

New Jersey Department of Energy
101 Commerce St.
Newark, NJ 07102
(201) 648-2744

Energy Survey Manual for Nonprofit Building (*9-A*)
Booklet outlines an energy management plan for schools, churches, hospitals, etc. Provides form for data collection and a sequential procedure for surveying the building and pinpointing problems.

New Mexico Energy and Minerals Department
525 Camino de los Marquez
Santa Fe, NM 87501
(505) 827-5950

Publications:
Home Energy Guide(*9-A*)
The New Mexico version of the general energy conservation and solar applications for homes suggests ways to conserve heat, add solar heat without additional equipment, naturally cool a house, efficiently and with solar, and reduce energy use for lighting and appliances.

New Mexico Solar Energy Institute
(NMSEI) at New Mexico State University
Solar Energy Educator
PO Box 3 SOL
Las Cruces, NM 88003
(505) 646-1846
Solar Energy Educator (*K-12*)
Tabloid newsletter provides current solar energy information, teaching materials and resources. Two inside pages are devoted to classroom activities, one page for elementary and one for secondary classes.

New York Energy Education Project (NYEEP)
SUNY at Albany

1400 Washington Ave.
Box 22100
Albany, NY 12222
(518) 473-1965

Publications:
Renewable Energy Activities (*7-12*)
Five activity books (32 activities in all) for general science, chemistry/physics, biology, earth science, and middle/junior high school science, complete with worksheets, teacher information, and illustrations. A sixth volume supplies background information for teachers. All were teacher-written and classroom tested.

New York State Energy Office
2 Rockefeller Plaza
Albany, NY 12223
(518) 473-4376

Publications:
Energy Conservation Education: An Action Approach (*4-9*)
Seventeen lessons ask students to both study and conserve energy in their classroom, school building, neighborhood, and home. Renewable sources,careers, and two construction projects (simple solar collector and windmill) also are presented. Each lesson includes sections for the teacher on aim, motivation, materials, development, summary, and home work assignment.

Energy Conservation Education for New York State (*7-12*)
These 18 activities could be useful anywhere teachers would like to present lessons on meter reading, insulation, hot water loss, conserving gasoline,comparing energy value of different foods,etc. Each activity contains student worksheets, directions, supplementary information, and answers for teachers. A grade level/subject area matrix is included so that lessons can be located easily to fit with a current topic of study. Excellent and comprehensive activities.

North Carolina Dept. of Public Instruction
Northeast Regional Education Center
Hayes Building
PO Box 1028
Williamston, NC 27892
(919) 792-5166

Publications:
Bibliography (*K-12*)
Sponsored by the North Carolina Alternative Energy Corporation, this annotated list describes all the energy education materials available from the lending library at the Northeast Regional Education Center in in Williamston, NC. Useful source of ideas and further references.

Oklahoma Corporation Commission
Energy Conservation Services Division
17 NE 28th St.
Oklahoma City, OK 73105
(405) 521-3941

Publication:
Energy Efficient Subdivision Design (9-A)
Book covers the principles of energy efficiency and supplemental solar. Discusses solar access and site design form the unusual and interesting perspective of a solar developer.

Oregon Department of Energy
102 Labor and Industries Bldg.
Salem, OR 97310-0830
(503) 378-4040

Publications:
Future Renewable: Final Report of the Oregon Alternate Energy Development Commission (9-A)
Book contains the projected energy demand and supply for Oregon through 2000, assesses the potential of renewable sources in the state, and makes lengthy recommendations. Useful for policy studies and discussion of future forecasts.

Western Regional Agricultural Engineering Service Fact Sheets (9-A)
Seven fact sheets cover fuelwood facts, burning wood introduction, wood heating cost comparison with fossil fuels and electricity, wood stove installation safety checklist, wood stove selection, and improving fireplace efficiency.

An Introduction to Passive Solar Energy (7-A)
Published by Pacific Power and Light, this 8-page booklet summarizes heat transfer mechanisms, passive solar options (including energy conservation requirements and retrofitted greenhouses), history and other sources of information.

Estimating SWECS Energy Production (9-A)
Accompanied by paragraphs of cautions and caveats, this 3-page report offers a five-step calculation to estimate energy production from a small wind energy conversion system.

An Introduction to Wind Energy (7-A)
This 24-page booklet, published by Pacific Power and Light, focuses on private wind energy conversion systems with their own storage and back-up. Also lists manufacturers of wind system components.

Mechanical Water Pumping Windmills Information Packet (9-A)
Fifty pages offer solid background material on maintaining the classic multi-vane windmill of the Plains designing and siting low-pressure water systems, a historical reading on wind-driven irrigation, technical

discussion of mechanical load estimation, and spec-sheets on a variety of water pumping machines.

Oregon Museum of Science and Industry
4015 SW Canyon Rd.
Portland, OR 97221
(503) 222-2828

Publication:
Mistee the Unicorn's Energy Journey(2-3)
Seven sections give teacher information and student activities on solar geothermal, wind, hydro, wood,and conservation. Incorporates home home activities and is constructed for use in the West and Northwest.

Pennsylvania Governor's Energy Council
Public Information Office
PO Box 8010
Harrisburg, PA 17105
(717) 783-9982

Publications:
Cogeneration For Pennsylvania Business and Industry (9-A)
Booklet provides a thorough overview of cogeneration: Rationale, technology, federal and state policy, financing, evaluating cogenerating potential. Also lists existing cogenerators in Pennsylvania.

Passive Solar for Today's Market (9-A)
Prepared by the Mid-Atlantic Solar Energy Association, this hefty volume covers everything passive---from definition, physics of heat, and the anatomy of a system to the economics, construction, and performance. Lots of illustrations make the text clearer still.

Rhode Island Governor's Energy Office
72 Orange St.
Providence, RI 02903
(401) 277-3774

Publication:
Keeping Warm
Staying Cool (9-A)
Two reports outline how to improve the efficiency of space conditioning systems. KEEPING WARM emphasizes furnace efficiency. STAYING COOL covers natural cooling techniques, solar pool heating, and efficient air conditioning.

Passive Solar New Construction for Rhode Island (7-A)
Amalgamates fact sheets on passive solar and adapts them to Rhode

Island Clear discussion of passive fundementals, useful to students in middle school and above.

Sacramento Municipal Utility District
MS 20, PO Box 15830
Sacramento, CA 95852-1830
(916) 732-5123

Publications:
Photovoltaic Power: Electricity from the Sun (9-A)
Program summary outlines the world's first commercial central station photovoltaic power plant. Details about the one megawatt installation and its peak load advantages are covered in depth.

Steam Power Is Rising(9-A)
Program summary of SMUD's geothermal installation only skims general information on geothermal energy; but facts about this particular power plant are plentiful.

San Diego Gas and Electric
PO Box 1831
San Diego, CA 92112
(619) 232-4252

Publications:
Solar Energy: Bright Spot on San Diego's Horizon (9-A)
Colorful booklet considers the components and basic functioning of solar pool heating, domestic water heating, and space conditioning. Also lists solar ordinances in San Diego, describes San Diego Gas and Electric's travelling solar exhibit, and notes SDGE's ongoing program of solar system monitoring. Emphasizes SDGE's efforts, but is informative as well.

Photovoltaics (9-A)
Fact sheet describes PV technology, system requirements for various purposes, economics, and applications. A summary discussion that assumes some background on photovoltaic effect and electrical principles.

South Carolina Research and Development Center
Clemson University
University Square Mall
302 Seneca Road
Clemson, SC 29631
(803) 656-4731

Publications:

Energy Savers (9-A)
Booklet provides plans for school energy management and conservation programs. Includes checklists for staff, faculty, and students of ways to conserve in classes (by subject area) and work areas (cafeteria, school buses, etc.).

Energy Fact Sheet: *Insulation and Cooling* (9-12)
Short summary presents the effects of insulation on cooling load. Includes graphs of the effct of R-value on cooling load coefficients, step-by-step explanation of how to calculate savings, and brief discussion of relative economics. Developed by the Southern Solar Energy Center.

Energy Fact Sheet: *Movable Insulation* (9-A)
Overview presents techniques to cut conduction, convection, radiation, and infiltration through windows.

Technical Brief: *Site Planning to Reduce Energy Costs* (9-A)
Fact Sheet developed by the Southern Solar Energy Center describes ways to prolong the seasons during which a house can be comfortable without help of the heating of cooling system, and ways to reduce the load of the system when it is in use.

South Carolina Passive Solar Home Design (9-A)
Manual covers passive solar principles modified by the climate of South Carolina. Emphasizes cooling and includes a helpful list of commonly made mistakes.

Sunspaces for South Carolina: *Principles and Construction of a Passive Solar Greenhouse* (9-A)
Booklet offers excellent and complete coverage of passive basics, solar energy in the Southeastern U.S., construction needs and processes, and three prepackaged designs. Charts and text accompany reader through neccessary calculations.

Energy Fact Sheet: *Photovoltaics* (9-A)
Provides brief answers to the most frequent questions on the photovoltaic effect, use of PV's costs, and their future.

Technical Brief: *Earth Cooling Tubes* (9-A)
Describes how earth cooling tubes function and highlights some design problems---high humidity, odor, and noise---that require special attention.

Tennessee Valley Authority
Citizen Action Office
400 West Summit Hill Knoxville, TN
37902 (615) 632-4100

Publication:
Landscaping for Energy Conservation (9-A)

Booklets from several sources discuss the factors affecting landscaping---winds, site topography, building orientation---and how to select local plants appropriate to these requirements.

Union Oil Company
PO Box 7600
Los Angeles, CA 90051

Publication:
The Story of Geothermal Energy (5-8)
Large, colorful poster diagrams the way geothermal heat is made within the earth and is tapped by modern technology. Short explanatory text and illustrative photos accompany the primary diagram. Emphasizes Union Oil's involvement.

Geothermal Energy (9-A)
Two Different booklets, one 12-page, one 36-page, feature beautiful photographs to illustrate basic geothermal principles and production. Union Oil's role is emphasized and international geothermal development is included.

Vermont Dept. of Public Service
Conservation and Renewable Energy Unit
State Office Bldg.
Montpelier, VT 05602
(802) 828-2393

Publication:
Central Heating with Wood or Coal (9-A)
Question and answer booklet introduces the options among solid fuel heating systems, discusses components, safety factors, tax credits and recent developments in solid fuel.

Do-It-Yourself Solar Construction Manual(9-A)
One manual on thermosiphoning air panels, and one on solar hot water systems give easy to follow directions accompanied by copious drawings.

Living In the Sun (9-A)
Book combines narrative on the principles and feasibility of solar in "cold, cloudy Vermont" with case studies of four different types of passive solar systems. Includes non-residential systemsand considers retrofits as well as new construction.

Virginia Office of Emergency and Energy Services
310 Turner Road
Richmond, VA 23225-6491
(804) 323-2970

Publication:
Technical Brief: Thermal Envelope Houses (9-A)
Brief report describes the basic thermal envelope design and operational characteristics. Summarizes the results of a performance monitoring study of one such house and discusses the controversy over the dynamics of air flow and heat transfer in thermal envelope housing. Good topic for science fair research.

Wisconsin Division of State Energy
101 South Webster St.
PO Box 7868
Madison, WI 53707
(608) 266-6850

Publication:
Evaluating Passive Solar in Wisconsin (9-A)
Presents information on system components, design factors, energy performance, and cost effectiveness of passive solar heating in Wisconsin. Includes knowledge gained from demonstration projects supported by the Division of State Energy.

Solar Flat Plate Collectors: Which One for You? (9-A)
Booklet walks the reader through comparative calculations of thermal efficiency energy value, explains SEIA certification ratings, and poses questions to determine the overall worth of any collector.

Solar Water Heating in Wisconsin: Is It for You?
Booklet uses a unique series of data worksheets to compute cost of water heating with fossil fuels, annual fuel cost after conservation, feasibility of solar water heat in terms of physical size and payback period.

MARINE SCIENCE EDUCATION
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SECONDARY

Alabama Cooperative Extension Service
Auburn University
Auburn, AL 36830

A marine science series has been prepared for 4-H groups as a cooperative effort of the office of Coastal Zone Management and the Sea Grant Advisory Service of the Alabama Cooperative Extension Service for the Mississippi-Alabama Sea Grant Consortium. These brief activity guides would be useful in the classroom, particularly in life science, biology, or environmental science classes.

4-H MARINE SCIENCE: Member's Guide, Activity I
A Beach and Dune Community

4-H MARINE SCIENCE: Member's Guide, Activity II
The Nomadic Beach

4-H MARINE SCIENCE: Member's Guide, Activity III
Building a Dune

4-H MARINE SCIENCE: Member's Guide
Harvesting from the Sea

4-H MARINE SCIENCE: Member's Guide, Simulation Game
Land Use for Marsh Beach

4-H MARINE SCIENCE: Agent's Guide, Simulation Game
Land Use for Marsh Beach

Alaska Sea Grant
Marine Advisory Service
University of Alaska
2651 Providence Avenue
Anchorage, Alaska 99504

Teachers should write for information concerning this program's continuing series of curriculum aids, which provide basic information about the marine environment and Alaskan marine resources.

Tides
This booklet, the fifth in the series, is an excellent addition to any unit on coastal environments, and explains a complex topic in a fashion suitable for average high school students.

Sea Grant Marine Advisory Service
College of Marine Studies
University of Delaware
700 Pilottown Road
Lewes, Delaware 19958

Teachers should write for publication list, which describes many interesting and useful free items such as;
MAS-12 The Hard Clam
Biology and life cycle of the hard clam; recreational and commercial clamming.

MAS-11 Delaware's Blue Crab
Describes the life history and commercial and recreational crabbing. Many others available.

Project COAST
University of Delaware Sea Grant Program
College of Education
Newark, Delaware 19176

Teachers can write for a free Project COAST brochure, that gives a brief rationale of the project and an annotated list of the many learning experiences, some of which are described below.

Publications:
#202 Distribution of Salt Marsh Life
This unit uses two experiments to examine how elevation and salinity affect the distribution of marsh plants and animals. By performing these experiments on a field trip, the student will be able to identify the animal life and vegetation of a salt marsh and understand the ecology of the marsh habitats. Teacher background and a bibliography for additional information are given; lesson preparation suggestions and instructional procedures for the various activities are also given. Data worksheets are available for the student, along with transparency or handout masters on the plants of the tide marsh, life of the salt marsh, and the salt marsh food web.
Unit Price; $2.00

#245 Food Webs in the Marine Habitat
The text, which can be used either as student reading or as a teacher presentation, expands on the student's knowledge of the concept of the ecosystem and describes oceanic organisms found at various trophic levels. Students are asked to answer questions throughout the text and construct a marine food web as a final exercise. A readiness test, post-test, glossary, bibliography, and transparency/handout masters of some representative organisms from all trophic levels are included.
Unit Price; $2.50

#301 The Oil Spill Problem
This unit covers a wide range of oil pollution subjects, including the

need for supertankers, their effects on the oil industry, the types of oil spill removal processes and the effects of oil pollution on the physical and biological environments. In the unit, students will engage in a variety of mathematics, economics, and science activities.
Unit Price; $2.50

#311 Simulation Game: Superport
This role-playing activity allows students to examine how a superport and its related industries can affect the marine environment. The unit includes a suggested daily schedule, an environmental knowledge and attitude survey, a vocabulary list, a student handbook, student activity suggestions, project and position paper topics, and a teacher-presented lecture outline on oil and the environment. Study guides and questions for the film CRISIS IN THE ESTUARY and the filmstrip MAN'S NATURAL ENVIRONMENT--CRISIS THROUGH ABUSE are also provided.
Unit Price;$2.50

Florida Sea Grant
Marine Advisory Program
G022 McCarty Hall
University of Florida
Gainesville, Florida 32611

Florida Marine Education Resources Bibliography
The resources listed here are not limited to Florida. They come from around the country and for the most part are as relevant for Louisiana teachers as they are for anyone else. Materials are indexed for Grades K-4, 4-7, Junior-Senior High School and High School-Adult. About 440 books are categorized in all. Each book is identified with publication information,a brief review, and its price.
Unit Price; $3.00

Man Meets Coast
Produced in August 1980 in support of the Year of the Coast by the Florida Sea Grant College Program, this publication is a 30-page comic book of coastal issues. The narrator, a pelican named Clifford P. Fischer, explains the value of the coast and the various threats to the coast. The book concludes with a recital of some of the steps that are being taken to protect the coast. In the last panel, Clifford declares, "What will tomorrow be like on the coast? It's up to you, and what you do today!". The illustrations are often excellent, and help present difficult concepts in an understandable form.
Unit Price; single copies, free; bulk orders, 30¢ each.

Fisheries Biology for Everyone
(SGEB-11)
An excellent resource for the teacher at any level, but particularly the teacher of upper elementary or highschool students, who have the degree of sophistication necessary to study fisheries as a resource, rather than the fish as an interesting animal.
Unit Price; $3.00

Florida Oceanographic Society
1212 Riverside Drive
Stuart, Florida 33494

The Source Book of Marine Sciences
An excellent "hands-on" supplement for your Environmental or Marine Science curriculum. The Source Book gives the student the opportunity to actively investigate marine science topics through 36 lab, field, and classroom units. Information is included on Marine Science Centers and sources, tips for teachers, informative field trips, and a sea of additional reference and film sources.
Unit Price; $7.50

Marine Extension Service
University of Georgia
PO Box Z
Brunswick, Georgia 31523

Publications:
Study Unit I: The Ocean Beach
Study Unit II: Profile of a Salt Marsh
These two excellent study units are available to the teacher. Single copies are free.The units concentrate on specific coastal environments and on marine organisms commonly found in the shallow coastal waters of Georgia. Each study unit consists of several integrated field and/or classroom activities related to a specific theme. Preceding activities there is a statement of the objectives of the study and pertinent natural history. Suggestions on organization and interpretation of data, techniques, related supplementary activities,and additional readings are also included. Although aimed specifically at the Georgia coast, these units can be used to great advantage by Louisiana teachers to point out likenesses and differences to their students.

Gulf Coast Research Laboratory
Bookstore
P.O. Drawer AG
Ocean Springs, MI 39564

Marine Educational Leaflets
This series of resource guides on marine science was developed by the students and staff at the Ocean Springs research facility. These publications are made available free to teachers and students studying the processes of the marine environment. Designed for grades 7-12.

Guide to Common Tidal Marsh Invertebrates of the Northeastern Gulf of Mexico
Guide;
This guide is designed to assist the teachers who are working in marine science or marine biology,either as a complete course, or as a unit in a

biology or environmental science course. The guide is the best synopsis of the macroinvertebrates of the area.

Curriculum Research and Development
Castle Memorial Hall 132
1776 University Avenue
Honolulu, Hawaii 96822

A catolog of educational materials developed for secondary schools is available from the address listed above. Of particular interest are the listings in science and environmental education. A few are listed below.

Air Pollution
A general discussion of the measurement, effects, and control of common air pollutants is applicable to any environment. Air pollution control technology is examined and an annotated list of federal laws relating to the subject is given.
Unit Price: $2.50

Animal Care
Instructions for constructing cages and other environments for keeping a variety of animals that are commonly found on the school campus. Basic information, including housing and food requirements, is given for more than 35 animals.
Unit Price: $2.50

Field Mapping
Directions for making detailed scaled maps of a school campus area, including the use contour lines. Instructions for making and using a stringed meter stick, sighter, range pole, and meter level are also included.
Unit Price: $2.50

Plant Propagation
An exploration of the various ways of propagating and maintaining plant growth. Propagation techniques include the use of bulbs, cuttings, seeds, seedlings, underground plant parts, grafting, air layering, and hydroponics. Investigations of each method are provided. Dormancy, planting media and containers, and watering also are discussed.
Unit Price: $2.50

Sampling Methods
An examination of the sampling methods used to determine population size, density, and frequency. Selective and random sampling, quadrats, and transects are discussed.
Unit Price: $2.50

Weather Instruments
Directions for constructing a weather station and various weather instruments such as a rain gauge, hygrometer, windvane, and anemometer. The procedures for settings up instruments to measure air

quality are also explained.
Unit Price: $2.50

Louisiana Sea Grant
Center for Wetland Resources
Louisiana State University
Baton Rouge, Louisiana 70803

A Guide to Saltwater Aquariums
The premise of this publication is that, contrary to common belief, saltwater aquariums are easy to maintain and do not require scientific expertise. There are a few things you need to know before getting started, and this booklet tells you what they are. In addition to the listing of basic equipment (tanks, filters, heaters, lights,etc.), the publication dicusses filling and conditioning the aquarium, some suggested tank inhabitants along with how and what to feed them, and potential maintenance problems.
Free

LSU Marine Studies High School Curriculum
This series of modules can be purchased as a unit for $28.00 from the address above, or each module can be purchased separately for the price listed.

Module 1, The Hydrologic Cycle. 46 pages
Unit Price; $3.50

Module 2, The Ocean Basin. 58 pages
Unit Price; $4.00

Module 3, Sea Floor Spreading and Plate Tectonics, 85 pages
Unit Price; $5.50

Module 4, The Nature of Sea Water, 83 pages
Unit Price; $5.50

Module 5, Light and Solar Energy: The Atmosphere and Oceans as a Heat Engine, 44 pages
Unit Price; $3.50

Module 6, Atmospheric and Oceanic Circulation, 78 pages
Unit Price; $5.00

Module 7, Basins, Estuaries and Fiords, 33 pages
Unit Price; $3.00

Module 8, Ocean Waves. 87 pages
Unit Price; $5.50

Module 9, Tides, 60 pages
Unit Price; $4.00

Maine Sea Grant
Marine Advisory Program
30 Coburn Hall
University of Maine
Orono, Maine 04469

A Teacher's Guide to the Whales of Maine
(E-MSG-83-10)
A whale curriculum guide for those interested in developing their own study units on marine mammals. Offers detailed up-to-date information on whale intelligence, feeding and locomotion, sighting charts, and numerous activities about whales and other marine mammals.
Unit Price; $5.00

Connections to the Sea
A 4-H Guide to Marine Education
(E-MSG-82-7)
Provides basic information about the ocean and our relationship to it. Detailed marine education activities; suggested resources; and a field guide to organisms.
Free.

Communications
University of Maryland
Sea Grant Program
1224 H.J.Patterson Hall
College Park, Maryland 20742

Publications:
Marine Science Education Workbooks: Food Webs in an Estuary
(UM-SG-ES-79-02)
This workbook introduces the subject of food chains and food webs, using basic examples from an estuarine system. Although the focus is on the Chesapeake Bay, the material may be adaptable to any similar estuarine environment. A teacher's narrative, a student activities section, and a resource section are included, and ways of coordinating these materials with conventional school science texts are suggested. Figures include diagrams of simple food chains.
Unit Price; $2.00

Marine Science Education Workbooks: Tides and Marshes
(UM-SG-ES-79-01)
Focusing on the physical process of the tides and their effects on shoreline ecosystems, this marine education workbook uses Chesapeake Bay tidal marshes as examples for use in either classroom or field trip studies. Each workbook contains a teacher's narrative, student activities, and a resource section, and suggests ways of coordinating these materials with the conventional school science texts. Figures include diagrams of intertidal zones, tidal effects on vegetation, and the moon's effect on tides.
Unit Price; $2.00

Marine Science Education Workbooks: The American Oyster
(UM-SG-ES-79-03)
The American Oyster, Maryland's most valuable seafood, serves as the subject of this workbook. The workbook contains a teacher's narrative, a student activities section, and a resource section. Suggestions for coordinating the material with conventional science texts is presented. Figures include diagrams of oyster anatomy, salinity charts, harvest graphs, and charts showing the location of oyster bars and the range of oyster predators. There are also pictures of harvesting devices and descriptions of the Chesapeake Bay oyster fishery.
Unit Price; $2.00

Decision Making and the Chesapeake Bay
Chesapeake Bay;
(UM-SG-ES-85-01)
This curriculum unit focuses on the Chesapeake Bay as both political and ecological watershed. Aimed primarily at high school science or social studies classes, DECISION MAKING AND THE CHESAPEAKE BAY provides a significant amount of information about the Chesapeake Bay, while involving the student in a simulated decision-making process.

The unit contains the following sections: teacher's guide, including seven specific activities; appendices with eleven suggested activities, including scripts for optional slide/tape show and video program; student activities; and a Chesapeake Bay Data Bank, which lists facts and figures pertinent to an understanding of the Chesapeake Bay.

DECISION MAKING AND THE CHESAPEAKE BAY can be used to support a comprehensive course in policy making and the environment, using the fully developed simulation game. The game provides descriptions of roles which represent different and often competing interests in the estuary. The unit can also be used to supplement environmental studies in general with the data bank and other sections providing useful information, such as the size of the estuary, descriptions of its major fisheries, and explanations of both current problems and the solutions posed by state and federal government and others.
Unit Price; $10.00

Mississippi-Alabama Sea Grant Consortium
P.O. Box 7000
Ocean Springs, Mississippi 39564-7000

Man and the Gulf of Mexico
This series of four paperback books can be used to supplement many advanced science courses; marine science, environmental science, or introductory biology courses. The curriculum materials were extensively field-tested in both inland and coastal schools of Mississippi and Alabama, and will probably be equally appropriate for use in Louisiana class rooms.

Marine and Estuarine Ecology

(*MASGP-82-007-1*)
Volume One of this series introduces fundamental concepts and vocabulary for understanding the ecology of marine environments, emphasizing the dynamics and showing the interdependency and diversity of the organisms. Plankton, nekton, intertidal organisms, coastal habitats, and coastal organisms are given careful examination. Special attention is given to instructing students in recording data accurately and logically, and in making sound generalizations. This volume also acquaints students with basic equipment for studying marine life.
Unit Price; $5.00

Marine Habitats
(*MASGP-82-007-2*)
Volume Two introduces five marine habitats---the salt marsh, the mud flat, the sound, the beach and the barrier island---and presents general information about the organisms that live in each. It emphasizes the interdependency of plants and animals and compares and contrasts the manner in which these organisms adapt themselves to their habitats.
Unit Price; $5.00

Diversity of Marine Plants
(*MASGP-82-007-3*)
This volume explains the biological classification system and the process of photosynthesis. Eleven experiments investigate seven types of algae, marine bacteria, sea grasses, and salt marsh plants.
Unit Price; $6.00

Diversity of Marine Animals
(*MASGP-82-00704*)
Volume Four introduces the physical characteristics, the behavior, and the natural environment of a variety of marine animals. Included are protozoans, sponges, coelenterates, ctenophores, polychaetes (marine annelids), mollusks, echinoderms, marine crustaceans (barnacles, blue crabs, hermit crabs, shrimp and horseshoe crabs), sea squirts and tunicates, sharks and stingrays (cartilaginous fish), seashore birds, marine turtles, and marine mammals. The book offers students fifteen activities for identifying and learning about marine animals and their adaptive behavior.
Unit Price: $6.00

Project CAPE
Dare County Schools
PO Box 640
Manteo, North Carolina 27954

Marine Organisms in the Classroom
A science unit that provides information on keeping marine organisms in the classroom. Lessons include establishing salt water aquaria, collecting organisms, their care and maintenance, food requirements and humane activities to study the animals.

Unit Price; $3.50

A Guide to Field Studies for the Coastal Environment
This science unit provides 25 activities and lessons for investigating the environmental factors of the coastal habitats: tides, wind, light intensity, salinity, etc. Excellent resource unit for earth science, biology, and environmental science teachers.
Unit Price; $3.50

University of North Carolina
Sea Grant College Program
Box 8605
North Carolina State University
Raleigh, North Carolina 27695-8605

North Carolina Education Manuals
This series is designed to help educators present the coast as a setting and a subject for study.

UNC-SG-78-14-A
Unit One, Coastal Geology.108 pages.
Unit Price; $1.00

UNC-SG-78-14-B
Unit Two, Seawater. 76 pages.
Unit Price; $1.50

UNC-SG-78-14-C
Unit Three, Coastal Ecology. 100 pages.
Unit Price; $1.50

UNC-SG-78-14-E
Unit Four, Coastal Beginnings. 175 pages.
Unit Price; $1.50

UNC-SG-82-1-F
CONNECTIONS: Guide to marine resources, living marine systems, and coastal field trips. Although portions of this material are specific to the Atlantic Coast, most of it is adaptable to the Gulf Coast.
Unit Price; $2.00

UNC-SG-84-05
COASTAL CAPERS: A MARINE EDUCATION PRIMER,by Lundie Spence and Vivian Barbee Coxe, provides activities that can be used by the elementary grade teacher, or adapted by the highschool teacher, to introduce and explain the marine environment. These activities will sharpen student skills in science, math, language arts, social studies and art.
Unit Price; $3.50

OCEAN PROSPECTS: a highshool teacher's guide to ocean-related

information. This 12-page booklet lists curriculum guides, activities, books, films, and periodicals---many of which are free---as well as information on water-related industries, water recreation, and marine science careers.
Unit Price; $1.00

Wendy Allen
Belle W. Baruch Institute for
Marine Biology and Coastal Research
P.O. Box 1630
Georgetown, South Carolina 29442

Sea Sampler---Aquatic Activities for the Field and Classroom. (*Secondary---SC-SG-TR85-2*)
Published by the South Carolina Sea Grant Program, these two books (one for elementary grades and one for secondary grades), provide field and classroom activities that relate to South Carolina's aquatic ecosystems. Each can be adapted for use elsewhere along the Atlantic or Gulf Coast.
Free

Marine Information Service
Sea Grant College Program
Texas A&M University
College Station, Texas 77843

Teachers can write to this address for a catalog listing many free or inexpensive materials for use in marine education.

Marine Organisms in Science Teaching (*TAMU-SG-80-403*)
This laboratory-oriented workbook includes 42 activities for using living marine organisms in existing science programs. The workbook is presented in a discovery type format which includes two sections for the teacher, a pre-lab and a post-lab, and a student investigation section. The student sections are formatted to allow easy duplication on school copying equipment. The activities use such organisms as brine shrimp, oysters, ghost, fiddler, and hermit crabs, sea anemones, barnacles, and sponges.
Unit Price; $4.00

Bird Island Basin (*TAMU-SG-86-401*)
Study guide for thr Bird Island Basin Environmental study area of the Padre Island National Seashore. Includes activities, keys, pictures, glossary and bibliography. Excellent material for comparisons between sandy and muddy intertidal habitats.
Unit Price; $2.00

Water Pollution Control Federation
Publication Order Department
601 Wythe Street
Alexandria, VA 22314-1994

Teachers can write to this address for a catalog listing many useful materials for aquatic education.

H2O TV: Videotape
This fast paced, entertaining video uses the latest computer graphics and animation techniques to challenge students into understanding water quality issues. After viewing this, students will want to learn more about how wastewater treatment works and what it means to them.

Wastewater Treatment: The Student's Resource Guide
The colorful Student Resource Guide follws up on the interest generated by the video to provide a comprehensive look at wastewater treatment. The emphasis is on why students should care and what they can do to help protect our water resources. This unit is designed for students in the 7th through 9th grades.

Wastewater Treatment: The Teacher's Resource Guide
This carefully organized teacher's guide ties the unit together by giving educators the background information they need to feel comfortable teaching this topic. The guide features thirteen activities, a summary of the student guide a glossary, and a sample test.

Order curriculum materials from Washington Sea Grant from:
Marine Education Project
Pacific Science Center
200 Second Ave. N.
Seattle, Washington 98109

Energy from the Sea
In this unit, students will explore the potential of offshore oil deposits, and proposals for tapping the energy of the tides, winds, currents, and ocean thermal differences. Attention is paid to the economic and environmental impact of exploiting these sources. The energy situation is a complex one with no clean-cut answers; the activities in this unit are correspondingly open-ended.
Unit Price; $6.00

Marine Biology Activities
MARINE BIOLOGY ACTIVITIES is an activity packet that intrduces students to the major themes of marine biology. Through classroom, laboratory, and field trip activities, students develop an understanding of structural adaptation, behavioral adaptation, zonation, and habitat. This packet includes teacher background information, student handouts and tests.
Unit Price; $6.00

Marshes, Estuaries, and Wetlands
MARSHES, ESTUARIES, AND WETLANDS is an activity packet which introduces students to the watershed system. Activities help students look at both salt and fresh water environments. An overview activity provides students with an opportunity to make and express their observations about fresh and salt water habitats. It allows them to view watersheds from a holistic perspective. Other activities focus more closely on field and lab investigations of salt marshes and estuaries. Finally, students are given a working model by which they can inventory fresh water wetlands in or near their communities. The inventory, based on the one used by King County Resource Planning Division for their wetlands survey, focuses on the physical, biological, aesthetic, visual and educational value of wetlands.
Unit Price; $6.00

Squalls on Nisqually: A Simulation Game
SQUALLS ON NISQUALLY is a simulation game about land use decision in a coastal zone environment. The simulation is based on a land use proposal submitted by the Weyerhauser Company for the development of land near the Nisqually Delta. The students are given the background to the historical development of the Nisqually Delta and relevant information from the environmental impact studies completed for the Nisqually. Through role-playing, students learn about the socio-political and economic interaction involved in a decision making process. Students are encouraged to research their roles and determine positions based on the data. This simulation process can be easily adapted for other land-use issues.
Unit Price; $6.00

Center for Environmental Education
624 9th Street NW
Washington, DC 20001

The Ocean: Consider the Connections.
A 100-page activity book published by the Center for Environmental Education. The book includes a forward by Isaac Asimov, and seven interesting chapters on oceanography, ocean animals, marine food chains, ecosystems and humanity's role in conserving ocean life. Although oriented toward the upper elementary students, this material can easily be adapted for use in the introduction of topics to the older students.
Free, send $2.00 for postage and handling.

Office of Coastal Zone Management
1825 Connecticut Avenue
Washington, DC 20235

Publication:
Coastal Awareness: A Resource Guide for Teachers of Senior High

Science
The office of Coastal Zone Management has produced an excellent aid for teachers of Environmental Science, or Marine Science. It is available free. It contains concepts, activities, resource suggestions for the teacher, and a glossary. It could be used in conjunction with any of the other sandy beach or marsh study guides mentioned in the curriculum guide or elsewhere in this resource guide.

MARINE SCIENCE EDUCATION
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ELEMENTARY GRADES

Office of Coastal Zone Management
1835 connecticut Avenue
Washington, DC 20235

Coastal Awareness: A Resource Guide for Teachers of Elementary Science

An excellent reference on marine ecology for the classroom teacher. The text gives the teacher an overall view of coastal habitats, water and sand movement, and life zones. Suggestions for field trips and a bibliography are also presented.
Free

Sea Grant Advisory Services
Marine Education Center
Virginia Institute of Marine Science
Gloucester Point, VA 23062

Fishy Activities for Your Small FDry
This activity unit has general information on fish and directs student learning of fish anatomy, life history and adaptation by making observations and drawing inferences. Booklet includes games, puzzles, arts and crafts,and tests. Write to inquire about supplementary slide program and worksheets which are available for additional cost.
Unit Price; $2.00

Sensing the Sea, Kindergarten and Grade One
Sensing the Sea, Grades Two and Three
These elementary units in marine ecology have three to four weeks of well-planned, brief, clearly explained activities to arouse student curiosity about the aquatic environment. Students learn by doing fun activities using simple materials. Leading questions are provided for teacher to stimulate student observation. Activities are centered around classroom aquarium and explicit, easy directions are given for aquarium set-up.
Unit Price; $2.00

Project COAST
University of Delaware Sea Grant Program
College of Education
Newark, Delaware 19176

Teachers can write for a free Project COAST brochure, that gives a brief rationale of the project and an annotated list of the many learning experiences, some of which are described below.

Publications:

#101 Animals with Shells, Kindergarten
The student activities in this unit will enable the child to recognize different animal shell types and to understand why the shell is important to the animal. A bibliography of books, film loops, and records is also provided.
Unit Price; $2.00

#104 Water for Fun
The recreational uses of water and the manner in which pollutants affect these activities are investigated. The unit involves activities such as viewing and naming waterways on maps, learning how they are used and what pollutes them, and making and labelling maps.
Unit Price; $2.00

#107 The Dunes at Play
Students use creative dramatics to learn about sand dunes. Teacher background includes information on sand dunes as well as instructions on how to use creative dramatics in teaching. A play about the formation, movement, and stabilization of sand dunes is provided. Also included are pre- and post-tests and slides of sand dunes.
Unit Price; $3.50

#114 Exploring a Pond
The conservation of water bodies and the associated life is the focus of this learning experience. Five major student activities are suggested: Introduction to the topic via films and filmstrips; Student reports and booklets on animal life in nearby ponds; A field trip to a pond to collect samples; Microscopic study of a pond sample; Creative construction of pond-scene models with animal inhabitants. A test with an answer key, a suggested materials list, and a teacher-student reference list are also provided.
Unit Price; $2.00

#109 The Not-So-Common Oyster
An independent study student packet comprises the first part of this unit. It contains a pre-test, and an enjoyable and informative story on the oyster, reading and vocabulary exercises, a post-test, and activity suggestions. The second section is a teacher packet which describes the independent study packet and supplies additional material for lessons in reading, vocabulary development, spelling, mathematics, art, and language arts. Also included are transparency/hand out masters of the anatomy of an oyster, word lists, and a crossword puzzle. Has a language arts supplement.

Unit Price; $2.50

Florida Sea Grant
Marine Advisory Program
G022 McCarty Hall
University of Florida
Gainesville, Florida 32611

Florida Marine Education Resources Bibliography
The resources listed here are not limited to Florida. They come from around the country and for the most part are as relevant for Louisiana teachers as they are for anyone else. Materials are indexed for Grades K-4, 4-7, Junior-Senior High School and High School-Adult. About 440 books are categorized in all. Each book is identified with publication information,a brief review, and its price.
Unit Price; $3.00

Duval County Marine Center
1347 Palmer Street
Mayport, Florida 32233

Marine Science for the First Grade
This unit introduces children to marine animals; what they look like, feel like, how they move, how they get food. The teacher will need to obtain animal specimens and shells. Activities are well described and transparency masters, book and music bibliographies are included. and sources, tips for teachers, informative field trips, and a sea of additional reference and film sources.
Free

Marine Science for the Second Grade
This unit gives children a feel for the vastness of the sea and explores some aspects pf the sea floor, the shore, animals, tides, currents, and resources. The unit has complete outline for course of study and activities are described. Transparency masters, book and music bibliographies are included.
Free

Marine Science for the Third Grade
The unit features direct observations of marine organisms with emphasis on diversity, similarities and differences, and adaptations for aquatic existence. Animal specimens are needed. There are several activities, transparency masters, book and music bibliographies, and two suggested field trips included.
Free

Marine Science for the Fourth Grade
The theory of ocean formation is investigated, which leads the student into the study of oceans today, topography, ocean currents, constant

change and the relationship of terrestrial life with the sea. Supplementary activities and test and transparency masters included.
Free

Marine Science for the Fifth Grade
This is a guide to understanding our oceans and the life within them through the study of plankton, marine resources, tools and equipment, and the relationship of sea life to non-living factors in the environment. Test and transparency masters are included.
Free

Marine Science Education Center Guidebook for Fifth Grade
This is an oceanography field guide. Three units provide an overview of oceanography. Included are: Background information for the teacher, classroom and outdoor activities, transparency masters, vocabulary development exercises and bibliography. Materials ordinarily provided in kit form from the Center are listed and are easily obtained locally.
Free

Sea World
7007 Sea World Dr.
Orlando, FL 32809

Publications:
Behavior, K-3 Curriculum Packet
This unit contains background information on marine mammals written for the teacher. Handouts (masters) for students illustrate the animals and provide some written information. Also has handouts on training marine mammals.
Free

Adaptations, K-3 Curriculum Packet
An ecology unit containing background information for the teacher, handouts, games, and multidisciplinary activities that can be used to learn about marine animals adaptations for survival. Emphasis is on marine mammals.
Free

Whales, K-3 Curriculum Packet
Teachers' background information on dolphins and whales, particularly killer whales, is included in this unit. It also has handouts for the students, including one comparing marine mammals to fish.
Free

Marine Ecology, K-6 Curriculum Packet
Marine Ecology, K-6 Curriculum Packet
This unit on ecology contains background information for the teacher plus handouts on marine organism lifestles. Topics include locomotion, protection, feeding, breathing. Many multidisciplinary activities and games.
Free

University of North Carolina
Sea Grant College Program
Box 8605
North Carolina State University
Raleigh, North Carolina 27695-8605

North Carolina Education Manuals
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UNC-SG-78-14-A
Unit One, Coastal Geology.108 pages.
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UNC-SG-78-14-C
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Unit Four, Coastal Beginnings. 175 pages.
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UNC-SG-82-1-F
CONNECTIONS: Guide to marine resources, living marine systems, and coastal field trips. Although portions of this material are specific to the Atlantic Coast, most of it is adaptable to the Gulf Coast.
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UNC-SG-84-05
COASTAL CAPERS: A MARINE EDUCATION PRIMER,by Lundie Spence and Vivian Barbee Coxe, provides activities that can be used by the lower elementary grade teacher, or for remedial or special education, to introduce and explain the marine environment. These activities will sharpen student skills in science, math, language arts, social studies and art.
Unit Price; $3.50

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